

WATERIA

SAFETY

DATA

SHEETS

BOOK B

U.S. DEPARTMENT OF LABOR
Occupational Safety and Health Administration

Form Approved
OMB No. 44-1187

MATERIAL SAFETY DATA SHEET

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Required under USL
Shipbuilding.

SECTION I

MANUFACTURER'S NAME <u>Independent Petrochemical Corporation</u>		EMERGENCY TELEPHONE NO. <u>(713) 923-1651</u>
ADDRESS (Number, Street, City, State, and ZIP Code) <u>3930 Chouteau Ave., St. Louis, Missouri 63110</u>		
CHEMICAL NAME AND SYNONYMS <u>Hydrocarbon</u>		TRADE NAME AND SYNONYMS <u>Odorless Mineral Spirits</u>
CHEMICAL FAMILY <u>Hydrocarbon</u>		FORMULA

SECTION II - HAZARDOUS INGREDIENTS

PAINTS, PRESERVATIVES, & SOLVENTS	%	TLV (Units)	ALLOYS AND METALLIC COATINGS	%	TLV (Units)
PIGMENTS			BASE METAL		
CATALYST			ALLOYS		
VEHICLE			METALLIC COATINGS		
SOLVENTS	100		FILLER METAL PLUS COATING OR CORE FLUX		
ADDITIVES			OTHERS		
OTHERS					
HAZARDOUS MIXTURES OF OTHER LIQUIDS, SOLIDS, OR GASES				%	TLV (Units)

SECTION III - PHYSICAL DATA

BOILING POINT (°F.)	346-403	SPECIFIC GRAVITY (H ₂ O=1) @ 60°F	0.759
VAPOR PRESSURE (mm Hg.) @ 100°F	4	PERCENT VOLATILE BY VOLUME (%)	
VAPOR DENSITY (AIR=1)	5.3	EVAPORATION RATE (n-BuAc = 1)	0.05
SOLUBILITY IN WATER	Neeligious		
APPEARANCE AND ODOR	Light colored liquid with trace of hydrocarbon odor.		

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (Method used) <u>Tag closed cup = 123°F</u>	FLAMMABLE LIMITS	Lel	Uel
		1.0	6.0
EXTINGUISHING MEDIA <u>Exclude air-use foam, CO₂, steam, water fog, dry chemicals.</u>			
SPECIAL FIRE FIGHTING PROCEDURES <u>Do not use water, exclude air, consult local fire marshal.</u>			
UNUSUAL FIRE AND EXPLOSION HAZARDS <u>Vapor forms explosive mixture with air between upper and lower explosion limits.</u>			

SECTION V - HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE

400 ppm

EFFECTS OF OVEREXPOSURE

Anesthesia-headache, nausea, dizziness, etc. Liquid slightly to moderately irritating to skin and eyes.

EMERGENCY AND FIRST AID PROCEDURES

Remove victim and restore breathing if required. Remove from skin with soap and water. Flush eyes with water.

SECTION VI - REACTIVITY DATA

STABILITY

UNSTABLE

CONDITIONS TO AVOID

STABLE

X

INCOMPATABILITY (Materials to avoid)

Not applicable

HAZARDOUS DECOMPOSITION PRODUCTS

Co, CO₂ when combusted

HAZARDOUS
POLYMERIZATION

MAY OCCUR

CONDITIONS TO AVOID

WILL NOT OCCUR

X

SECTION VII - SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

Avoid open flame or spark sources. Provide adequate ventilation.

WASTE DISPOSAL METHOD

Evaporate or flush with water to an open, well ventilated area. Use oil sewer if available. Remove to container.

SECTION VIII - SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION (Specify type)

Organic canister mask or air pack.

VENTILATION

LOCAL EXHAUST

SPECIAL

Desireable

MECHANICAL (General)

OTHER

With approved Class D explosion-proof motors and switches

PROTECTIVE GLOVES

EYE PROTECTION

Normally not required

Conventional eye cover to guard against unexpected splashing.

OTHER PROTECTIVE EQUIPMENT

SECTION IX - SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING

Avoid open flames and spark sources. Avoid splash-filling. Provide adequate ventilation. Avoid excessive heat.

OTHER PRECAUTIONS

INDEPENDENT PETROCHEMICAL CORP.

© ~~CHARTER~~ OIL PRODUCTS

CHARTER INTERNATIONAL OIL COMPANY

SOLVENTS — INDUSTRIAL NAPHTHAS — CHEMICALS

3960 CHOUTEAU AVENUE • ST. LOUIS, MISSOURI 63110 • 314 652-6050

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SPECIFICATIONS

ODORLESS MINERAL SPIRITS

Pounds Per Gallon at 60°F	6.32
Aniline Point °F	184
Flash Point °F T.C.C.	125
Vapor Pressure mm Hg. at 20°C	1.2
Evaporation Rate BuAc-1	0.1
Solubility Parameter	7.2
Boiling Range, °F	
Initial	355
50%	364
D.P.	395
Kauri Butanol Value	26
Paraffins	95.9
Naphthenes	4.1



MATERIAL SAFETY DATA SHEET

CONOCO CORPORATION, P.O. BOX 111111
DALLAS, TEXAS 75211-0111

Oil, GP Spindle 15

I. MATERIAL IDENTIFICATION

Name: GP Spindle Oil 15
Conoco Product Code: 7361
Synonyms: Petroleum Lubricating Oil
Chemical Family: Petroleum Hydrocarbon
Manufacturer: Conoco Inc.
Address: P.O. Box 1267, Ponca City, OK 74603

CAS Registry No.: Mixture
Transportation Emergency No.:
(800) 424-9300 (Chemtrec)
Product Information No.:
(405) 767-6000

II. HAZARDOUS INGREDIENTS

HAZARD DATA

Hazard Determination:

Health Effect Properties:

Hydrocarbon/Oil Mist

Potential respiratory toxicity.

Physical Effect Properties:

Product/Mixture: None.

Not applicable.

III. PHYSICAL DATA

Appearance and Odor: Light brown liquid; mild petroleum hydrocarbon odor.

Boiling Range (°F) 650-950

Specific Gravity (H₂O=1)

0.85

Vapor Pressure (mmHg)

Nil

% Volatile (by volume)

Nil

Vapor Density (Air=1)

Not Applicable

Evaporation Rate (Ether=1)

Nil

Solubility in Water

Insoluble

IV. REACTIVITY DATA

Stable: X

Unstable:

Hazardous Decomposition Products: Normal combustion forms carbon dioxide;
incomplete combustion may produce carbon monoxide.

Conditions To Avoid: Strong oxidizing materials, heat, flame.

Hazardous Polymerization: Will not occur.

V. FIRE AND EXPLOSION HAZARD DATA

Flash Point (Method used): 330° F (PMCC) Autoignition Temperature: 650° F

Handle and store in accordance with NFPA procedure for Class III B Combustible Liquid.

Extinguishing Media: Use water spray, dry chemical, foam, or carbon dioxide.

Special Fire Fighting Procedures: Water or foam may cause frothing. Use water to keep fire-exposed containers cool. Water spray may be used to flush spills away from exposures.

Unusual Fire and Explosion Hazards: Products of combustion may contain carbon monoxide, carbon dioxide, and other toxic materials. Do not enter enclosed or confined space without proper protective equipment including respiratory protection.

National Fire Protection Agency (NFPA) CLASSIFICATION

HAZARD RATING

Health 0 Fire 1 Reactivity 0

Least - 0

Slight - 1

Moderate - 2

High - 3

Extreme - 4

VI. TRANSPORTATION AND STORAGE

DOT HAZARD CLASS: Not applicable.

Precautions To Be Taken In Handling And Storing: Product is Class III B Combustible Liquid per NFPA Code No. 30-1984. Store and handle accordingly.

Shipping Paper Description: Not D.O.T. regulated.

Placard: Not D.O.T. regulated.

D.O.T. Label: Not regulated.

OSHA Label: CAUTION: Minimize exposure. Inhalation of concentrations of oil mist may cause irritation of the respiratory tract. Use in well-ventilated area.

VII. HEALTH HAZARD INFORMATION

PEL 5 mg/m³* TLV 5 mg/m³* Ceiling Value Not Established AEL 5 mg/m³

* This value refers to airborne mists of petroleum-based cutting oils or white mineral oils.

Primary Route(s) of Entry: Skin, inhalation.

Signs and Symptoms of Exposure/Medical Conditions Aggravated by Exposure:

No adverse health effect has been identified specifically for this product.

Health effect information from animal and human studies has been included on related materials, even though health experts may disagree as to the significance of this data.

VII. HEALTH HAZARD INFORMATION (continued)

Mouse skin painting studies have shown that highly solvent-refined petroleum distillates having a boiling point below 700° F, and which are similar to ingredients in this product, have not caused skin tumors.

The product may cause irritation to eyes, lungs, or skin after prolonged or repeated exposure.

Listed as Carcinogen or Potential Carcinogen by: NTP No IARC No OSHA No

VIII. EMERGENCY AND FIRST AID PROCEDURES

Eyes: Immediately wash with fresh water for at least 15 minutes and get medical attention:

Skin: Remove contaminated clothing as soon as possible. Wash exposed skin thoroughly with soap and water. If irritation persists, consult a physician.

Launder contaminated clothing before reuse. Extremely contaminated leather shoes should be discarded.

If exposed to hot oil, immediately cool with cold water. Do not attempt to remove oil but continue to cool exposed areas with cold packs and seek medical assistance immediately.

Inhalation: If overexposure occurs, remove individual to fresh air. If breathing stops, administer artificial respiration.

Ingestion: If this material is swallowed, do not induce vomiting. If vomiting begins, lower victim's head in an effort to prevent vomitus from entering lungs. Immediately consult a physician. Do not attempt to give liquid to an unconscious person.

Note to Physicians: Gastric lavage by qualified medical personnel may be considered, depending on quantity of material ingested.

IX. SPILL, LEAK AND DISPOSAL PROCEDURES

RCRA HAZARDOUS WASTE: Yes No X

In Case Of Spill Or Leak: Contain spill immediately in smallest area possible. Recover as much of the product itself as possible by such methods as vacuuming, followed by soaking up residual fluids by use of absorbent materials. Remove contaminated items including soils and place in proper container for disposal. Avoid washing, draining or directing material to storm or sanitary sewers.

Waste Disposal Method: Recycle as much of the recoverable product as possible. Dispose of nonrecyclable material by such methods as controlled incineration complying with federal, state and local regulations.

January 17, 1986/LUBC0210

X. PRECAUTIONARY MEASURES

Respiratory Protection: None required except under unusual circumstances such as described in Section V.

Ventilation: Normal shop ventilation.

Protective Gloves: Impervious.

Eye Protection: Safety glasses with side shield.

Other Precautions: Skin contact should be minimized. Complete protective clothing if material is being handled hot. Launder or discard contaminated clothing. Discard contaminated leather material.

The above data is based on tests and experience which Conoco believes reliable and are supplied for informational purposes only. CONOCO DISCLAIMS ANY LIABILITY FOR DAMAGE OR INJURY WHICH RESULTS FROM THE USE OF THE ABOVE DATA AND NOTHING CONTAINED THEREIN SHALL CONSTITUTE A GUARANTEE, WARRANTY (INCLUDING WARRANTY OF MERCHANTABILITY) OR REPRESENTATION (INCLUDING FREEDOM FROM PATENT LIABILITY) BY CONOCO WITH RESPECT TO THE DATA, THE PRODUCT DESCRIBED, OR THEIR USE FOR ANY SPECIFIC PURPOSE, EVEN IF THAT PURPOSE IS KNOWN TO CONOCO.



Conoco Inc.

MOTC0090

Revised 27-Feb-92

Printed 29-Mar-92



FLEET HEAVY DUTY MOTOR OIL

MATERIAL IDENTIFICATION

Manufacturer/Distributor	Conoco Inc. P.O. Box 2197 Houston, TX 77252	
Phone Numbers	General Information	1-(713)293-5550
	Transport Emergency	1-(800)424-9300
	Medical Emergency	1-(800)441-3637
Chemical Family	Petroleum Hydrocarbon	
Trade Names and Synonyms	Product Codes: 6210/6211/6220/6230/6240/6244/6245/ 6250/6260/6261/6265/6266 Grades: SAE 10W, 10W LP, 10W-30, 15W-40, 20W-20, 30, 40, 50; 10 TBN SAE 15W-40, 10W-30, 30, 40	
NFPA Ratings	Health:	0
	Flammability:	1
	Reactivity:	0
NPCA-HMIS Ratings	Health:	1
	Flammability:	1
	Reactivity:	0
	Personal Protection rating to be supplied by user depending on use conditions.	

OSHA HAZARD DETERMINATION

Hazardous Ingredients

Components of this material are not known to be hazardous as defined by OSHA's Hazard Communication Standard, 29 CFR 1910.1200.

(continued)

PHYSICAL DATA

Boiling Point	650 to 1200°F
Vapor Pressure	Nil
Vapor Density	>1 (Air = 1.0)
% Volatiles	Nil
Evaporation Rate	Nil
Water Solubility	Insoluble
Odor	Mild petro. hydrocarbon
Form	Liquid
Color	Dark Brown
Specific Gravity	0.87-0.89 (Water = 1)

HAZARDOUS REACTIVITY

Instability	Stable.
Incompatibility	Incompatible with strong oxidizing materials. Avoid heat, sparks, and flame.
Decomposition	Hazardous gases/vapors produced are carbon dioxide; incomplete combustion may produce carbon monoxide.
Polymerization	Polymerization will not occur.

FIRE AND EXPLOSION DATA

Flash Point	340 deg F
Method	PMCC
Autoignition	650 deg F
Fire and Explosion Hazards	Class IIIB Combustible Liquid (NFPA).
Extinguishing Media	Water Spray. Foam. Dry Chemical. CO2.
Special Fire Fighting Instructions	<p>Special Fire Fighting Procedures: Water or foam may cause frothing. Use water to keep fire-exposed containers cool. Water spray may be used to flush spills away from exposures.</p> <p>Unusual Fire and Explosion Hazards: Products of combustion may contain carbon monoxide, carbon dioxide and other toxic materials. Do not enter enclosed or confined space without proper protective equipment including respiratory protection.</p>

(continued)

HEALTH HAZARD INFORMATION

Primary Route(s) of Entry : Skin.

Signs and Symptoms of Exposure/Medical Conditions Aggravated by Exposure:

Mouse skin painting studies have shown that highly solvent-refined petroleum distillates similar to ingredients in this product have not caused skin tumors. The product, as with many petroleum products, may cause minor skin, eye, or lung irritation, especially if poor hygienic practices or inadequate engineering design allow prolonged or repeated exposure.

Laboratory studies with mice have shown that "used" motor oil applied repeatedly to the skin caused skin cancer. In these studies, the "used" motor oil was not removed between applications. Health hazards to "used" motor oil can be minimized by avoiding prolonged skin contact.

Carcinogenicity	None of the components in this material is listed by IARC, NTP, OSHA, or ACGIH as a carcinogen.
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Exposure Limits	
FLEET HEAVY DUTY MOTOR OIL	
TLV (ACGIH)	None Established
PEL (OSHA)	None Established
<hr/>	
Safety Precautions	Wash thoroughly after handling. Wash clothing after use.

FIRST AID

Inhalation	If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician.
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Skin Contact	The compound is not likely to be hazardous by skin contact, but cleansing the skin after use is advisable.
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Eye Contact	In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Call a physician.
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Ingestion	If swallowed, do not induce vomiting. Immediately give two glasses of water. Never give anything by mouth to an unconscious person. Call a physician.
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Notes to Physician	Activated charcoal slurry may be administered. To prepare activated charcoal slurry, suspend 50 grams activated charcoal in 400mL water and mix thoroughly. Administer 5mL/kg, or 350mL for an average adult.

PROTECTION INFORMATION

Generally Applicable Control Measures and Precautions

Ventilation: Normal shop ventilation.

(continued)

PROTECTION INFORMATION (continued)

Personal Protective Equipment

Respiratory Protection: None required except under unusual circumstances such as described in the Fire and Explosion Hazard Section.

Protective Gloves: Should be worn when the potential exists for prolonged or repeated skin exposure. NBR or neoprene recommended.

Eye Protection: Safety glasses with side shields if splashing is probable.

Other Protective Equipment: Coveralls if splashing is probable.

Other Precautions: Avoid any prolonged or repeated skin contact with "used" motor oil. Wash thoroughly with soap and water after contact.

SPILL, LEAK AND DISPOSAL INFORMATION

Spill, Leak, or Release

NOTE: Review FIRE AND EXPLOSION HAZARDS and SAFETY PRECAUTIONS before proceeding with clean up. Use appropriate PERSONAL PROTECTIVE EQUIPMENT during clean up. Dike spill. Prevent liquid from entering sewers, waterways or low areas. Recover free liquid for reuse or reclamation. Soak up with sawdust, sand, oil dry or other absorbent material.

Remove source of sparks and flame.

Waste Disposal

Treatment, storage, transportation and disposal must be in accordance with applicable Federal, State/Provincial, and Local regulations. Recover nonusable free liquid and dispose of in an approved and permitted incinerator.

SHIPPING INFORMATION

DOT

Proper Shipping Name

Not regulated.

IATA/IMO

Proper Shipping Name

Not restricted.

STORAGE CONDITIONS

Store in accordance with National Fire Protection Assn regulations.

TITLE III HAZARD CLASSIFICATIONS

Acute No

Chronic No

Fire No

Reactivity No

Pressure No

(continued)

REGULATORY INFORMATION

OSHA HAZARD DETERMINATION

The material is not known to be hazardous as defined by OSHA's Hazard Communication Standard, 29 CFR 1910.1200.

EPA DETERMINATIONS

CLEAN AIR ACT, 40 CFR 50, SECTIONS 112, 114

The material is not known to contain a Hazardous Air Pollutant in sufficient quantity to make it subject to CAA regulations.

COMPREHENSIVE ENVIRONMENTAL RESPONSE, COMPENSATION, & LIABILITY ACT, (CERCLA/SUPERFUND), 40 CFR 302
Not applicable; this material is covered by the CERCLA petroleum exclusion. Releases are not reportable.

SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT OF 1986, TITLE III (SARA) - SECTIONS 302, 304, 313

SECTION 302/304 - Extremely Hazardous Substances (40 CFR 355)

The material is not known to contain extremely hazardous substances at greater than 1.0% concentration.

SECTION 313 - List of Toxic Chemicals (40 CFR 372)

The material contains the following chemical(s) at a level of 1.0% or greater (0.1% for carcinogens) on the list of Toxic Chemicals and is subject to toxic chemical release reporting requirements.

Toxic Chemical	: Zinc Alkyl Dithiophosphate
CAS Registry Number	: 68649-42-3
Approximate Concentration	: 1.6%
(Upper Bound)	

TOXIC SUBSTANCES CONTROL ACT (TSCA) (40 CFR 710)

The material is a mixture as defined by TSCA. The chemical ingredients in this material are in the Section 8(b) Chemical Substance Inventory (40 CFR 710) and/or are otherwise in compliance with TSCA. In the case of ingredients obtained from other manufacturers, Conoco relies of the assurance of responsible third parties in providing this statement.

RESOURCE CONSERVATION AND RECOVERY ACT (RCRA), 40 CFR 261, SUBPART C AND D

The material, when discarded or disposed of, is not specifically listed as a hazardous waste in Federal regulations; however, it could be considered hazardous if it meets criteria for being toxic, corrosive, ignitable or reactive according to U.S. EPA definitions (40 CFR 261).

(continued)

REGULATORY INFORMATION (continued)

FEDERAL WATER POLLUTION CONTROL ACT, CLEAN WATER ACT,
40 CFR 116.4A, Section 311.

The material contains the following ingredient(s) which
is considered hazardous if spilled in navigable waters.

Ingredient : Petroleum Hydrocarbons
Reportable Quantity : Film or sheen upon or
discoloration of the water
surface or adjoining shoreline.

FOREIGN REGULATIONS

CANADIAN HAZARDOUS PRODUCTS ACT (WHMIS)

The material is not a WHMIS Controlled Product.

Emergency Medical/Transport Number : 1-613-348-3616

STATE REGULATIONS

CALIFORNIA SAFE DRINKING WATER AND TOXIC ENFORCEMENT ACT
OF 1986 ("PROPOSITION 65")

This material is not known to contain any ingredient(s)
subject to the Act.

PENNSYLVANIA WORKER AND COMMUNITY RIGHT TO KNOW ACT

The material contains the following ingredient(s) found on
the Pennsylvania Worker and Community Right-to-Know Act
Hazardous Substances List:

Ingredient : Zinc Alkyl Dithiophosphate
CAS Registry Number : 68649-42-3
Category : Environmental Hazard

Non-hazardous ingredient(s) information is withheld as
trade secret in accordance with Section 11 of
Pennsylvania Worker and Community Right to Know Act.

ADDITIONAL INFORMATION AND REFERENCES

Product Use : Motor Oil

The above data are based on tests, experience, and other information which Conoco believes reliable and are supplied for informational purposes only. However, some ingredients may have been purchased or obtained from third-party manufacturers. In these instances, Conoco, in good faith, relies on information provided by those third parties. Since conditions of use are outside our control, CONOCO DISCLAIMS ANY LIABILITY FOR DAMAGE OR INJURY WHICH RESULTS FROM USE OF THE ABOVE DATA. NOTHING CONTAINED HEREIN SHALL CONSTITUTE A GUARANTEE, WARRANTY (INCLUDING WARRANTY OF MERCHANTABILITY) OR REPRESENTATION (INCLUDING FREEDOM FROM PATENT LIABILITY) BY CONOCO WITH RESPECT TO THE DATA, THE MATERIAL DESCRIBED, OR ITS USE FOR ANY SPECIFIC PURPOSE, EVEN IF THAT PURPOSE IS KNOWN TO CONOCO.

Responsibility for MSDS:

Safety, Health, & Env. Affairs
Conoco Inc.
PO Box 2197
Houston, TX 77252
713/293-5550

End of MSDS

MATERIAL SAFETY DATA SHEET

L-4638-A
September 1985



An explanation of the terms used herein may be found in OSHA 29 CFR 1910.1200,
available from OSHA regional or area offices.

(Essentially similar to U.S. Department of Labor Form OSHA-20
and generally accepted in Canada for information purposes)
Do Not Duplicate This Form.

I. PRODUCT IDEN

PRODUCT Oxygen

CHEMICAL NAME Oxygen

SYNONYMS Not applicable

FORMULA O_2

CHEMICAL FAMILY Not applicable

MOLECULAR WEIGHT 32.00

TRADE NAME Oxygen

II. HAZARDOUS INGREDIENTS

For mixtures of this product request the respective component Material Safety Data Sheets. See Section IX.

MATERIAL (CAS NO.)	Wt (%)	1984-1985 ACGIH TLV-TWA (OSHA-PEL)
Oxygen (7782-44-7)	100	None currently established (None currently established)

III. PHYSICAL DATA

BOILING POINT, 760 mm. Hg	-183°C (-297.4°F)	FREEZING POINT	-218.4°C (-361.1°F)
SPECIFIC GRAVITY (H ₂ O = 1)	Gas	VAPOR PRESSURE AT 20°C.	Gas
VAPOR DENSITY (air = 1)	1.105 @ 25°C	SOLUBILITY IN WATER, % by wt.	Negligible
PERCENT VOLATILES BY VOLUME	100	EVAPORATION RATE (Butyl Acetate = 1)	Not applicable
APPEARANCE AND ODOR Colorless, odorless gas at normal temperature and pressure.			

EMERGENCY PHONE NUMBER

IN CASE OF EMERGENCIES involving this material, further information is available at all times:

In the USA 304 — 744-3487

In Canada 514 — 645-5311

For routine information contact your local supplier

Union Carbide requests the users of this product to study this Material Safety Data Sheet (MSDS) and become aware of product hazards and safety information. To promote safe use of this product a user should (1) notify its employees, agents and contractors of the information on this MSDS and any product hazards and safety information, (2) furnish this same information to each of its customers for the product, and (3) request such customers to notify their employees and customers for the product of the same product hazards and safety information.

UNION CARBIDE CORPORATION ☐ LINDE DIVISION
UNION CARBIDE CANADA LIMITED ☐ LINDE DIVISION

IV. HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE: None currently established.

EFFECTS OF SINGLE (ACUTE) OVEREXPOSURE:

SWALLOWING — No evidence of adverse effects from available information.

SKIN ABSORPTION — No evidence of adverse effects from available information.

INHALATION — Breathing 80% or more oxygen at atmospheric pressure for more than a few hours may cause nasal stuffiness, cough, sore throat, chest pain and breathing difficulty. Breathing oxygen at higher pressure increases the likelihood of adverse effects within a shorter time period. Breathing pure oxygen under pressure may cause lung damage and also central nervous system effects resulting in dizziness, poor coordination, tingling sensation, visual and hearing disturbances, muscular twitching, unconsciousness and convulsions. Breathing oxygen under pressure may cause prolongation of adaptation to darkness and reduced peripheral vision.

SKIN CONTACT — No evidence of adverse effects from available information.

EYE CONTACT — No evidence of adverse effects from available information.

EFFECTS OF REPEATED (CHRONIC) OVEREXPOSURE: No evidence of adverse effects from available information.

OTHER EFFECTS OF OVEREXPOSURE: See "Notes to Physician."

MEDICAL CONDITIONS AGGRAVATED BY OVEREXPOSURE: See "Notes to Physician."

SIGNIFICANT LABORATORY DATA WITH POSSIBLE RELEVANCE TO HUMAN HEALTH HAZARD EVALUATION: None currently known.

EMERGENCY AND FIRST AID PROCEDURES:

SWALLOWING — This product is a gas at normal temperature and pressure.

SKIN — No emergency care anticipated.

INHALATION — Remove to fresh air. Give artificial respiration if not breathing. Keep victim warm and at rest. Call a physician.

EYES — No emergency care anticipated.

NOTES TO PHYSICIAN: Supportive treatment should include immediate sedation, anti-convulsive therapy if needed, and rest. Animal studies suggest that the administration of certain drugs, including phenothiazine drugs and chloroquine, increases the susceptibility to toxicity from oxygen at high concentrations or pressures. Animal studies also indicate that vitamin E deficiency may increase susceptibility to oxygen toxicity.

Airway obstruction during high oxygen tension may cause alveolar collapse following absorption of the oxygen. Similarly, occlusion of the eustachian tubes may cause retraction of the eardrum and obstruction of the paranasal sinuses may produce "vacuum-type" headache.

Newborn premature infants exposed to high oxygen concentrations may suffer delayed retinal damage which can progress to retinal detachment and blindness (retrolental fibroplasia). Retinal damage can also occur in adults exposed to 100% oxygen under greater than atmospheric pressure, particularly in individuals whose retinal circulation has been previously compromised.

All individuals exposed for long periods to oxygen at high pressure and all who exhibit overt oxygen toxicity should have ophthalmologic examinations.

WHEN USED IN WELDING AND CUTTING: Read and understand the manufacturer's instructions and the precautionary label on the product. See American Standard Z49.1 "Safety In Welding and Cutting" published by the American Welding Society, P.O. Box 351040, Miami, Florida 33135 and OSHA Publication 2206 (29CFR1910), U.S. Government Printing Office, Washington, D.C. 20402 for more detail. For further SAFETY AND HEALTH information, refer to Linde's free publication, L-52-529, "Precautions and Safe Practices for Electric Welding and Cutting", as well as L-2035, "Precautions and Safe Practices for Gas Welding, Cutting, and Heating." You may obtain copies from your local supplier, or by writing to Union Carbide Corporation, Linde Division, Communications Department, 39 Old Ridgebury Road, Danbury, Connecticut, 06817-0001.

NOTE: Suitability for use as a component in underwater breathing gas mixtures is to be determined by or under the supervision of personnel experienced in the use of underwater breathing gas mixtures and familiar with the effects, methods, frequency and duration of use, hazards, side effects and precautions to be taken.

V. FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (test method)	Not applicable	AUTOIGNITION TEMPERATURE	Not applicable
FLAMMABLE LIMITS IN AIR, % by volume	LOWER Not applicable	UPPER Not applicable	

EXTINGUISHING MEDIA: Vigorously accelerates combustion. Use media appropriate for surrounding fire. Water (i.e. safety shower) is the preferred extinguishing media for clothing fires.

SPECIAL FIRE FIGHTING PROCEDURES: Evacuate all personnel from danger area. Immediately cool containers with water spray from maximum distance until cool, then move containers away from fire area if without risk.

UNUSUAL FIRE AND EXPLOSION HAZARDS: Oxidizing agent, vigorously accelerates combustion. Contact with flammable materials may cause fire or explosion. Container may rupture due to heat of fire. No part of a container should be subjected to a temperature higher than 52°C (approximately 125°F). Most containers are provided with a pressure relief device designed to vent contents when they are exposed to elevated temperature. Smoking, flames and electric sparks in the presence of enriched oxygen atmospheres are potential explosion hazards.

VI. REACTIVITY DATA

STABILITY		CONDITIONS TO AVOID: See Section IX.
UNSTABLE	STABLE	
	X	

INCOMPATIBILITY (materials to avoid): Combustible materials, asphalt, flammable materials, especially oils and greases.

HAZARDOUS DECOMPOSITION PRODUCTS: None.

HAZARDOUS POLYMERIZATION		CONDITIONS TO AVOID: None currently known.
May Occur	Will not Occur	
	X	

VII. SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED: Shut off leak if without risk. Ventilate area of leak or move leaking container to well-ventilated area. Remove all flammable materials from vicinity. Oxygen must never be permitted to strike an oily surface, greasy clothes, or other combustible material.

WASTE DISPOSAL METHOD: Slowly release into atmosphere, in an open, outdoors area. Remove all flammable materials from vicinity.

VIII. SPECIAL PROTECTION INFORMATION**RESPIRATORY PROTECTION (specify type):** Not required.

VENTILATION	LOCAL EXHAUST — Not applicable.
	MECHANICAL (general) — Acceptable.
	SPECIAL — Not applicable.
	OTHER — Not applicable.

PROTECTIVE GLOVES: Preferred for cylinder handling.**EYE PROTECTION:** Select in accordance with OSHA 29 CFR 1910.133.**OTHER PROTECTIVE EQUIPMENT:** Metatarsal shoes for cylinder handling. Select in accordance with OSHA 29 CFR 1910.132 and 1910.133.**IX. SPECIAL PRECAUTIONS**

WARNING: High pressure gas. Vigorously accelerates combustion. Avoid contact with oils, greases and other flammable materials. Never use manifolds for oxygen cylinders unless specifically designed for such use. Use only with equipment conditioned for oxygen service. Use piping and equipment adequately designed to withstand pressures to be encountered. Protect container against physical damage. Isolate from combustible gas installations and combustible materials by adequate distance or by gas-tight, fire-resistive barriers. Protect against over-heating. Never use an oxygen jet for cleaning purposes of any sort, especially clothing, as it increases the likelihood of an engulfing fire. Note: Reverse flow into cylinder may cause rupture. Use a check valve or other protective apparatus in any line or piping from the cylinder to prevent reverse flow.

MIXTURES: When two or more gases, or liquefied gases are mixed, their hazardous properties may combine to create additional, unexpected hazards. Obtain and evaluate the safety information for each component before you produce the mixture. Consult an Industrial Hygienist, or other trained person when you make your safety evaluation of the end product. Remember, gases and liquids have properties which can cause serious injury or death. Be sure to read and understand all labels and other instructions supplied with all containers of this product.

NOTE: Compatibility with plastics should be confirmed prior to use. For safety information on general handling of compressed gas cylinders, obtain a copy of pamphlet P-1, "Safe Handling of Compressed Gases in Containers" from the Compressed Gas Association, Inc., 1235 Jefferson Davis Highway, Arlington, VA 22202.

OTHER HANDLING AND STORAGE CONDITIONS: Never work on a pressurized system. If there is a leak, close the cylinder valve, blow down the system by venting to a safe place, then repair the leak. Never lubricate oxygen valves, regulators, etc., with any combustible substance.

The opinions expressed herein are those of qualified experts within Union Carbide. We believe that the information contained herein is current as of the date of this Material Safety Data Sheet. Since the use of this information and these opinions and the conditions of use of the product are not within the control of Union Carbide, it is the user's obligation to determine the conditions of safe use of the product.

**GENERAL OFFICES**

IN THE USA:
Union Carbide Corporation
Linde Division
39 Old Ridgebury Road
Danbury, CT 06817-0001

IN CANADA:
Union Carbide Canada Limited
Linde Division
123 Eglinton Avenue East
Toronto, Ontario M4P 1J3

Other offices in principal cities all over the world.

MATERIAL SAFETY DATA SHEET



An explanation of the terms used herein may be found in OSHA 29 CFR 1910.1200, available from OSHA regional or area offices.
(Essentially similar to U.S. Department of Labor Form OSHA-20 and generally accepted in Canada for information purposes)
Do Not Duplicate This Form



Oxygen
L-4637-B
September 1985

I. PRODUCT IDENTIFICATION

PRODUCT Oxygen (Cryogenic Liquid)

CHEMICAL NAME Oxygen

SYNONYMS Not applicable

FORMULA O₂

CHEMICAL FAMILY Not applicable

MOLECULAR WEIGHT 32.00

TRADE NAME Liquid Oxygen

II. HAZARDOUS INGREDIENTS

For mixtures of this product request the respective component Material Safety Data Sheets. See Section IX.

MATERIAL (CAS NO.)	Wt (%)	1984-1985 ACGIH TLV-TWA (OSHA-PEL)
Oxygen (7782-44-7)	100	None currently established (None currently established)

III. PHYSICAL DATA

BOILING POINT, 760 mm. Hg	-183°C (-297.4°F)	FREEZING POINT	-218.4°C (-361.1°F)
SPECIFIC GRAVITY (H ₂ O = 1)	1.141 @ -183°C	VAPOR PRESSURE AT 20°C.	Gas
VAPOR DENSITY (air = 1)	1.105 @ 25°C	SOLUBILITY IN WATER, % by wt.	Not applicable
PERCENT VOLATILES BY VOLUME	100	EVAPORATION RATE (Butyl Acetate = 1)	High

APPEARANCE AND ODOR Light Blue cryogenic liquid, odorless.

IV. EMERGENCY PHONE NUMBER

IN CASE OF EMERGENCIES involving this material, further information is available at all times:

In the USA 304 — 744-3487

In Canada 514 — 645-5311

For routine information contact your local supplier

Union Carbide requests the users of this product to study this Material Safety Data Sheet (MSDS) and become aware of product hazards and safety information. To promote safe use of this product a user should (1) notify its employees, agents and contractors of the information on this MSDS and any product hazards and safety information, (2) furnish this same information to each of its customers for the product, and (3) request such customers to notify their employees and customers for the product of the same product hazards and safety information.

UNION CARBIDE CORPORATION ☐ LINDE DIVISION
UNION CARBIDE CANADA LIMITED ☐ LINDE DIVISION

IV. HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE: See Section II.

EFFECTS OF SINGLE (ACUTE) OVEREXPOSURE:

SWALLOWING — Severe frostbite may result from contact with liquid. No harmful effects expected from vapor.

SKIN ABSORPTION — No evidence of adverse effects from available information.

INHALATION — Breathing 80% or more oxygen at atmospheric pressure for more than a few hours may cause nasal stuffiness, cough, sore throat, chest pain and breathing difficulty. Breathing oxygen at higher pressure increases the likelihood of adverse effects within a shorter time period. Breathing pure oxygen under pressure may cause lung damage and also central nervous system effects resulting in dizziness, poor coordination, tingling sensation, visual and hearing disturbances, muscular twitching, unconsciousness and convulsions. Breathing oxygen under pressure may cause prolongation of adaptation to darkness and reduced peripheral vision.

SKIN CONTACT — Liquid may cause severe frostbite. No harmful effects expected from vapor.

EYE CONTACT — Liquid may cause severe frostbite. No harmful effects expected from vapor.

EFFECTS OF REPEATED (CHRONIC) OVEREXPOSURE: No evidence of adverse effects from available information.

OTHER EFFECTS OF OVEREXPOSURE: See "Notes to Physician."

MEDICAL CONDITIONS AGGRAVATED BY OVEREXPOSURE: See "Notes to Physician."

SIGNIFICANT LABORATORY DATA WITH POSSIBLE RELEVANCE TO HUMAN HEALTH HAZARD EVALUATION: None currently known.

EMERGENCY AND FIRST AID PROCEDURES:

SWALLOWING — This product is a gas at normal temperature and pressure.

SKIN — For exposure to liquid, immediately warm frostbite area with warm water (not to exceed 105°F). Remove and thoroughly air contaminated clothing. In case of massive exposure, remove clothing while showering with warm water. Call a physician.

INHALATION — Remove to fresh air. Give artificial respiration if not breathing. Keep victim warm and at rest. Call a physician.

EYES — In the case of splash contamination, immediately flush eyes with water for at least 15 minutes. See a physician, preferably an ophthalmologist, immediately.

NOTES TO PHYSICIAN: Supportive treatment should include immediate sedation, anti-convulsive therapy if needed, and rest. Animal studies suggest that the administration of certain drugs, including phenothiazine drugs and chloroquine, increases the susceptibility to toxicity from oxygen at high concentrations or pressures. Animal studies also indicate that vitamin E deficiency may increase susceptibility to oxygen toxicity.

Airway obstruction during high oxygen tension may cause alveolar collapse following absorption of the oxygen. Similarly, occlusion of the eustachian tubes may cause retraction of the eardrum and obstruction of the paranasal sinuses may produce "vacuum-type" headache.

Newborn premature infants exposed to high oxygen concentrations may suffer delayed retinal damage which can progress to retinal detachment and blindness (retrolental fibroplasia). Retinal damage can also occur in adults exposed to 100% oxygen under greater than atmospheric pressure, particularly in individuals whose retinal circulation has been previously compromised.

All individuals exposed for long periods to oxygen at high pressure and all who exhibit overt oxygen toxicity should have ophthalmologic examinations.

V. FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (test method)	Not applicable	AUTOIGNITION TEMPERATURE	Not applicable
FLAMMABLE LIMITS IN AIR, % by volume	LOWER Not applicable	UPPER	Not applicable

EXTINGUISHING MEDIA: Oxidizing agent. Vigorously accelerates combustion. Use media appropriate for surrounding fire. Water (i.e. safety shower) is the preferred extinguishing media for clothing fires.

SPECIAL FIRE FIGHTING PROCEDURES: Evacuate all personnel from danger area. Immediately cool containers with water spray from maximum distance until cool then move containers away from fire if without risk. Do not discharge water sprays into liquid oxygen.

UNUSUAL FIRE AND EXPLOSION HAZARDS: Oxidizing agent, vigorously accelerates combustion. Contact with flammable materials may cause fire or explosion. Closed container may rupture due to heat of fire. Liquid oxygen will freeze water rapidly. Containers are provided with pressure relief devices that are designed to vent the contents when they are exposed to elevated temperatures. Do not walk on or roll equipment over spill as this could cause explosion. Liquid causes cryogenic "burns" (frostbite-like injury; see Section IV). Smoking, flames, and electric sparks in the presence of enriched oxygen atmospheres are potential explosion hazards.

VI. REACTIVITY DATA

STABILITY		CONDITIONS TO AVOID: Heat (See Section IX). Oxygen reacts with many materials. Refer to NFPA 491M "Manual of Hazardous Chemical Reactions."
UNSTABLE	STABLE	
	X	

INCOMPATIBILITY (materials to avoid): Flammable and combustible materials, especially oils and greases, including many materials not normally considered flammable.

HAZARDOUS DECOMPOSITION PRODUCTS: None.

HAZARDOUS POLYMERIZATION		CONDITIONS TO AVOID: None currently known.
May Occur	Will not Occur	
	X	

VII. SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED: Immediately evacuate all personnel from danger area.

Extremely cold oxidizing liquid and gas. Allow spilled liquid to evaporate. Do not walk on or roll equipment over spill as this could cause explosion. Contact with flammable materials may cause fire or explosion. Shut off leak if without risk. Ventilate area of leak or move leaking container to ventilated area.

WASTE DISPOSAL METHOD: Keep personnel away. Liquid oxygen should be dumped into an outdoor pit filled with clean, grease-free and oil-free gravel, where it will safely evaporate.

VII 3545A PROTECTION INFORMATION**RESPIRATORY PROTECTION** (specify type): Not required.

VENTILATION	LOCAL EXHAUST — Preferred.
	MECHANICAL (general) — Adequate.
	SPECIAL — Not applicable.
	OTHER — Not applicable.

PROTECTIVE GLOVES: Loose-fitting Cryogenic gloves.**EYE PROTECTION:** Select in accordance with OSHA 29 CFR 1910.133**OTHER PROTECTIVE EQUIPMENT:** Metatarsal shoes for cylinder handling. Protective clothing where needed. Cuffless trousers should be worn outside the shoes. High top shoes are preferred. Select in accordance with OSHA 29 CFR 1910.132 and 1910.133.**IX 3545A SPECIAL PRECAUTIONS**

Extremely cold oxidizing liquid and gas. Vigorously accelerates combustion. Contact with liquid or cold gas causes severe frostbite. Combustibles with liquid oxygen may explode on ignition or contact. Keep oil, grease and combustibles away. Use only with equipment conditioned for oxygen service. Use piping and equipment adequately designed to withstand the pressures and temperatures to be encountered. Do not get liquid in eyes, on skin or clothing. Store and use with adequate ventilation. Close valve when not in use and when empty. Clothing exposed to oxygen should be removed immediately and aired out to reduce the likelihood of an engulfing fire. Ignition sources, such as static electricity generated in clothing by walking, etc., should be prevented. Protect container against physical damage. Isolate from combustible gas installations and combustible materials by adequate distance or by gas-tight, fire-resistant barriers. Protect against overheating.

MIXTURES: When two or more gases, or liquefied gases are mixed, their hazardous properties may combine to create additional, unexpected hazards. Obtain and evaluate the safety information for each component before you produce the mixture. Consult an Industrial Hygienist, or other trained person when you make your safety evaluation of the final product. Remember, gases and liquids have properties which can cause serious injury or death.

Be sure to read and understand all labels and other instructions supplied with all containers of this product.

NOTE: Compatibility with plastics should be confirmed prior to use. For safety information on general handling of compressed gas cylinders, obtain a copy of pamphlet P-1, "Safe Handling of Compressed Gases in Containers", pamphlet P-12, "Safe Handling of Cryogenic Liquids", and pamphlet G-4, "Oxygen", from the Compressed Gas Association, Inc., 1235 Jefferson Davis Highway, Arlington, VA 22202.

OTHER HANDLING AND STORAGE CONDITIONS: For storage and use at consumer sites, refer to NFPA 50, "Bulk Oxygen Systems", and NFPA 51, "Oxygen-Fuel Gas System for Welding, Cutting, and Allied Processes," available from National Fire Protection Association, Batterymarch Park, Quincy, MA 02210. Never work on a pressurized system. If there is a leak, close the cylinder valve, blow down the system by venting to a safe place, then repair the leak. Never lubricate oxygen valves, regulators, etc., with any combustible substance.

The opinions expressed herein are those of qualified experts within Union Carbide. We believe that the information contained herein is current as of the date of this Material Safety Data Sheet. Since the use of this information and these opinions and the conditions of use of the product are not within the control of Union Carbide, it is the user's obligation to determine the conditions of safe use of the product.

**GENERAL OFFICES**

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123 Eglinton Avenue East
Toronto, Ontario M4P 1J3

Other offices in principal cities all over the world.



CORRO-CORP. PRODUCTS COMPANY
MSDS NUMBER - CORP-00-0185

ADDRESS : One Kaiser Plaza, Suite 650
Oakland, California 94612

LABEL NO. : 0066

MSDS NO. : 089-0

PRODUCT NAME : PC-60 Unburned

DATE : September 15, 1986 (Revised)

OTHER NAMES : NA

EMERGENCY PHONE: (415) 462-1147

CHEMICAL NAME: NA

DOT ID NUMBER : NA

I. HAZARDOUS INGREDIENTS

Amorphous silica (SiO_2) : <5%, typical (CAS # 7631-86-9)

* Trivalent chromium (Cr^{+3} as in Cr_2O_3) : <15%, typical (CAS # 7440-47-3)

This product is a solid shape and in order to present a dust hazard, particles must be reduced to respirable size.

* Compounds of trivalent chromium, present in the unused product, may, as the result of use, be converted to hexavalent chromium. Hexavalent chromium compounds are considered carcinogens by the National Toxicology Program (NTP) and the World Health Organization's International Agency for Research on Cancer (IARC).

II. EXPOSURE LIMITS

1986-87 ACGIH TLV's : $0.5 \text{ mg/m}^3 \text{ Cr}^{+3}$; $0.05 \text{ mg/m}^3 \text{ Cr}^{+6}$, 10 mg/m^3 silica.

OSHA 1910,1000 PEL's : 0.5 mg/m^3 soluble Cr , 20 mppcf silica.

III. PHYSICAL DATA

APPEARANCE : Solid

COLOR : Dark

SPECIFIC GRAVITY (gm/cc): 2.5 - 3.5

BOILING POINT: NA

ODOR : None

SOLUBILITY IN WATER (%): Nil

MELTING POINT: NA

pH : NA

VAPOR PRESSURE (mm Hg) : NA

IV. PERSONAL PROTECTIVE EQUIPMENT

RESPIRATORY PROTECTION : Respirator approved by NIOSH/MSHA and adequate for contaminant concentrations encountered.

HAND PROTECTION : Gloves are recommended.

EYE PROTECTION : Safety glasses are recommended.

OTHER : NA

V. EMERGENCY MEDICAL PROCEDURES

USED PRODUCT:

Skin: Wash with soap and water.

Eyes: Irrigate immediately with plenty of water. Obtain medical attention if necessary.

SED PRODUCT : May contain hexavalent chromium compounds.

Skin: Wash with soap and mild detergent in running water. Remove contaminated clothing.

Eyes: Irrigate immediately with plenty of water lifting upper and lower lids occasionally. Continue for 15 minutes. Get medical attention.

VI. HEALTH INFORMATION

ARCINOGENICITY: See Section I.**INHALATION:** Long term exposure to trivalent chromium appears to have no significant health effect. Hexavalent chromium compounds, potentially present in the used product, are irritants of the respiratory tract and skin, and repeated or prolonged exposure may increase the risk of cancer (see Section I). May aggravate pre-existing respiratory conditions.**SKIN:** Repeated or prolonged contact with potentially hazardous used product may cause sensitization dermatitis.**EYES:** Contact with potentially hazardous used product may be corrosive to tissues.

VII. FIRE & REACTIVITY DATA

STABILITY : Stable**INCOMPATIBILITY :** NA**FLASH POINT :** NA**EXTINGUISHING MEDIA:** NA**FLAMMABLE LIMITS:** NA**CONDITIONS TO AVOID:** NA**UNUSUAL FIRE & EXPLOSION HAZARDS:** NA**HAZARDOUS DECOMPOSITION PRODUCTS:** NA

VIII. ENVIRONMENTAL

SPILL OR LEAK PROCEDURES: We recommend that the purchaser establish a spill prevention, control and counter measure plan. This plan should include procedures for proper storage as well as clean-up of spills or leaks. The procedures should conform to safe practices and provide for proper recovery or disposal. Depending on the quantity spilled, notification of the National Response Center (800-424-8802) may be required in case of hazardous substances. (See EPA and DOT regulations; also various state and local regulations.)**WASTE DISPOSAL METHOD:** Chromite (Cr^{+3}) may, in normal use, be converted chemically to a chromate (Cr^{+6}). Hexavalent chromium (Cr^{+6}) is considered a hazardous material. Test product to determine hazard status and disposal requirements under federal, state and local laws and regulations.

IX. ADDITIONAL INFORMATION

1. Use an approved respirator if dust is created during handling, installation or tearout.
2. Toxic risk may be altered by chemical or physical changes caused by conditions of use.
3. This product is a solid refractory shape.

Information in this MSDS was obtained from sources which we believe are reliable. However, the information is provided without any representation or warranty, express or implied, regarding the accuracy or correctness. The conditions or methods of handling, storage, use and disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons we do not assume responsibility and expressly disclaim liability for damage or expense arising out of or in any way connected with the handling, storage, use or disposal of the product.

Océ-Bruning, Inc.

COMPANY - - - SAUGET, IL
MSDS NUMBER ASSIGNED
CCPC-00-0186

100
0186

1800 Bruning Drive West
Itasca, IL 60143

Non-emergency information phone: 1-708-351-7579
EMERGENCY PHONE: 1-800-424-9300 CHEMTREC 24 HOURS

MATERIAL SAFETY DATA SHEET

page 1 of 2

Issue Date: 11-01-91

I. PRODUCT IDENTIFICATION

PRODUCT NAME: BRUNING PD ACTIVATOR
SYNONYMS: BRUNING PD DEVELOPER
CATALOG NUMBER: 28-0080, 28-0110, 28-0111, 28-0222, and 28-0404
ITEM NUMBERS: 22-750080, 22-761003, 22-761012, 22-761021, & 22-761404
DOT HAZARD CLASS: None
HMIS HAZARD RATING: Health-2, Flammability-1, Reactivity-0

II. HAZARDOUS INGREDIENTS/IDENTITY INFORMATION

This is confidential information to be used for health and safety purposes only.

COMPONENT	CAS #	ACGIH(TLV)	OSHA(PEL)	WT%
Benzyl alcohol	100-51-6	none	none	10%
Ethylene glycol *	107-21-1	50 PPM(Ceiling)	50 PPM(Ceiling)	35%
Hexylene glycol	107-41-5	25 PPM(Ceiling)	25 PPM(Ceiling)	10%
Oleic acid	112-80-1	none	none	5%
Ethanolamine	141-43-5	3 PPM(TWA) 6 PPM(STEL)	3 PPM(TWA) 6 PPM(STEL)	20%
2-(2-aminoethoxy)ethanol	929-06-6	none	none	20%

* This product contains ethylene glycol which is subject to the reporting requirements of section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372.

III. PHYSICAL/CHEMICAL CHARACTERISTICS

BOILING POINT.....: 216 - 650 Deg F
VAPOR PRESSURE.....: <1 mm Hg
VAPOR DENSITY.....: 3 (air=1)
SOLUBILITY IN WATER...: complete
pH.....: 11.0
APPEARANCE AND ODOR...: clear, pale yellow liquid, no distinct odor.

SPECIFIC GRAVITY.....: 1.05
MELTING POINT.....: not known
EVAPORATION RATE
(butyl acetate=1)...: <.1

IV. FIRE AND EXPLOSION HAZARD DATA

FLASH POINT.....: 233 deg. F (Pensky-Martin c.c.)
FLAMMABLE LIMITS.....: not known
EXTINGUISHING MEDIA.....: water, CO2, dry powder
SPECIAL FIRE FIGHTING PROCEDURES....: Firefighters should use self contained breathing apparatus.
UNUSUAL FIRE AND EXPLOSION HAZARDS...: none known.

V. REACTIVITY DATA

STABILITY.....: stable
CONDITIONS TO AVOID.....: open flame, high temperature
INCOMPATIBILITY (Materials to avoid)...: strong acids, oxidizing agents
HAZARDOUS DECOMPOSITION OR BYPRODUCTS.: In fire conditions or when reacting with strong oxidizing agents, oxides of carbon and nitrogen are produced.
HAZARDOUS POLYMERIZATION.....: will not occur

VI. HEALTH HAZARD DATA**ROUTES OF ENTRY: SIGNS & SYMPTOMS OF EXPOSURE/HEALTH HAZARDS (ACUTE & CHRONIC):**

Eye Contact.: Causes eye irritation. Acute: Extremely irritating, potential eye damage. Draize Primary Irritation Test Score: 57.7 "extremely irritating". Chronic: None known.

Skin Contact: May cause itching, irritation. Acute: Prolonged contact without washing or protection can be extremely irritating and may cause burns. Not corrosive per 49 CFR part 173 appendix A (results negative after 4 hours contact). Chronic: repeated, prolonged contact could defat skin and cause dermatitis.

Inhalation...: A very objectionable odor was produced in lab test at concentrations well below the TLV's and dryness of the throat was observed. Acute: Marked irritation of nose, throat, and lungs. Chronic: None known.

Ingestion....: Causes irritation of the digestive tract. Acute: Low oral toxicity. LD 50 (rat): 3500mg/Kg. Chronic: None known.

CARCINOGENICITY: None of the ingredients are listed as carcinogens by NTP, IARC, or OSHA. Ames tests of the mixture were negative, indicating no mutagenic activity.

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE: none known.

EMERGENCY FIRST AID PROCEDURES:

Eye.....: Summon a physician at once and meanwhile irrigate with large amounts of running water for at least 15 minutes.

Skin.....: Wash with soap and water.

Inhalation: Remove to fresh air.

Ingestion.: See a physician.

VII. PRECAUTIONS FOR SAFE HANDLING AND USE

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: Mop or flush spill with water and blot with towels. Use protective gloves and goggles.

WASTE DISPOSAL METHOD: Incineration. Small quantities may be diluted with water and flushed down the drain if local regulations permit.

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING: Do not rub eyes after contact with fluid. Avoid puncturing containers.

OTHER PRECAUTIONS: When repairing or servicing equipment, use the same precautions for handling contaminated parts as recommended for the fluid.

VIII. CONTROL MEASURES

RESPIRATORY PROTECTION: Not required unless fighting fires.

VENTILATION: Sufficient ventilation is needed to prevent odors and to handle the heat produced by the PD Copy Machine used.

Local exhaust.....: Not required

Special...: Not required

Mechanical (General): Usually adequate

Other....: Not required

PROTECTIVE GLOVES...: Rubber or polyethylene recommended for handling the fluid.

EYE PROTECTION.....: Safety glasses or goggles recommended.

OTHER PROTECTIVE CLOTHING OR EQUIPMENT...: Not required.

WORK/HYGENIC PRACTICES.....: Wash hands after contact with fluid.

CARPENTER TECHNOLOGY CORPORATION

MATERIAL



GENERAL OFFICES:
P.O. BOX 662
READING, PA 19603

CERRO COPPER PRODUCTS COMPANY
MATERIAL NUMBER: CERRO-CC-0157

CERRO COPPER PRODUCTS
DIV CERRO CORP
P O BOX 681
EAST ST LOUIS IL 62202

SAFETY DATA SHEET IS BELIEVED TO BE ACCURATE, AS OF THE REVISION DATE, CARPENTER TECHNOLOGY CORPORATION MAKES NO WARRANTY WITH RESPECT THERETO AND DISCLAIMS ALL LIABILITY FROM RELIANCE THEREON. NO WARRANTY, EITHER EXPRESS OR IMPLIED OF MERCHANTABILITY OR FITNESS OF ANY NATURE WITH RESPECT TO THE MATERIAL OR DATA HEREIN IS MADE HEREUNDER.

FOR ADDITIONAL INFORMATION, PLEASE CONTACT THE HEALTH AND SAFETY DEPARTMENT AT: 215-371-2000.

SECTION I - PRODUCT IDENTIFICATION

PRODUCT DESCRIPTION: TYPE 303 PROJECT 70 STAINLESS

RED PAINT

SECTION II - HAZARDOUS INGREDIENTS

INGREDIENTS	%	PEL / TLV 8 HOUR TWA UNLESS OTHERWISE NOTED	
		PEL	TLV
IRON *	70.00	10.0 MG/M3	
1309-37-1		5.0 MG/M3	
CHROMIUM	18.00	1.0 MG/M3	
7440-47-3		0.5 MG/M3	
NICKEL	9.00	1.0 MG/M3	
7440-02-0		1.0 MG/M3	
MANGANESE	1.80	5.0 MG/M3	
7439-96-5		5.0 MG/M3 (DUST)	1.0 MG/M3 (FUME) 3.0 MG/M3 STEL (FUME)
COBALT	.75	0.1 MG/M3	
7440-48-4		0.1 MG/M3	

* - THESE SUBSTANCES ARE REGULATED IN THEIR OXIDE FORM

THE ABOVE PERCENT CONCENTRATIONS ARE CONSIDERED NOMINAL AND ARE PROVIDED FOR INDUSTRIAL HYGIENE PURPOSES. THEY DO NOT REPRESENT A CERTIFICATION OF CONTENT.

SECTION III - PHYSICAL DATA

BOILING PT.: HIGH
MELTING PT.: 2400 to 2800 F
SPECIFIC GRAVITY: 7.5 to 8.5
VAPOR PRESSURE: NIL
VAPOR DENSITY: NIL
SOLUBILITY IN WATER: INSOLUBLE
APPEARANCE AND ODOR: SOLID,
ODORLESS METAL

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

UNLESS OTHERWISE NOTED, NONE. PRODUCT IS A SOLID METAL.
NOTES:

SECTION V - HEALTH HAZARD DATA

SPECIALTY STEEL ALLOYS ARE GENERALLY NOT CONSIDERED HAZARDOUS IN THE FORM SHIPPED (SOLID BARS, BILLETS, RODS, WIRE, ETC.). HOWEVER, IF YOUR PROCESS INVOLVES GRINDING, MELTING, WELDING, CUTTING, OR ANY OTHER PROCESS THAT CAUSES A RELEASE OF DUST OR FUME, HAZARDOUS LEVELS OF DUST OR FUME OF THE CONSTITUENTS OF THESE ALLOYS COULD BE GENERATED. THE FOLLOWING IS A LIST OF POTENTIAL HEALTH EFFECTS FOR ALL HAZARDOUS ELEMENTS THAT ARE POSSIBLY CONTAINED IN ANY OF OUR ALLOYS. PLEASE REFER TO SECTION II TITLED "HAZARDOUS INGREDIENTS" FOR A LIST OF THOSE SPECIFIC ELEMENTS CONTAINED IN THIS PARTICULAR ALLOY.

HEALTH EFFECTS:

*ALUMINUM: METAL DUST AND OXIDE IS GENERALLY CONSIDERED A "NUISANCE" PARTICULATE. MAY CAUSE IRRITATION OF THE EYES, NOSE, AND THROAT IN EXCESSIVE CONCENTRATIONS.

*BERYLLIUM: CAN CAUSE DERMATITIS, ALSO CAUSES A SEVERE CHRONIC LUNG DISEASE KNOWN AS "CHRONIC BERYLLIUM DISEASE" WHICH IS OFTEN FATAL.

BORON OXIDE: HAS CAUSED IRRITATION OF THE EYES, NOSE, AND SKIN OF EXPERIMENTAL ANIMALS. IT MAY HAVE THE SAME EFFECT ON HUMANS.

CHROMIUM: FERROCHROME ALLOYS HAVE BEEN ASSOCIATED WITH LUNG CHANGES IN WORKERS EXPOSED TO THESE ALLOYS.

COBALT: FUME OR DUST CAUSES IRRITATION OF THE NOSE AND THROAT AND MAY CAUSE AN ALLERGIC SKIN RASH. ALSO HAS BEEN REPORTED TO CAUSE RESPIRATORY DISEASE WITH SYMPTOMS RANGING FROM COUGH AND SHORTNESS OF BREATH TO PERMANENT DISABILITY AND DEATH. THE SYMPTOMS FREQUENTLY GO AWAY WHEN EXPOSURE HAS STOPPED, BUT SOMETIMES THE SYMPTOMS PROGRESS AFTER EXPOSURE HAS CEASED.

COPPER: FUME OR DUST CAUSES IRRITATION OF THE EYES, NOSE, AND THROAT AND A FLU-LIKE ILLNESS CALLED METAL FUME FEVER. SYMPTOMS INCLUDE FEVER, MUSCLE ACHES, NAUSEA, CHILLS, DRY THROAT, COUGH, WEAKNESS, AND SWEET OR METALLIC TASTE IN THE MOUTH.

SECTION V - HEALTH HAZARD DATA (CONTINUED)

HAFNIUM: HAFNIUM SALTS HAVE CAUSED IRRITATION OF THE EYES AND SKIN IN EXPERIMENTAL ANIMALS. OTHER HAFNIUM COMPOUNDS HAVE CAUSED LIVER DAMAGE IN ANIMALS ON PROLONGED FEEDING.

IRON OXIDE: REPEATED EXPOSURE TO IRON OXIDE FUME OVER A PERIOD OF YEARS MAY CAUSE X-RAY CHANGES OF THE LUNGS, BUT DOES NOT CAUSE THE EXPOSED PERSON TO BECOME ILL.

MANGANESE: INHALATION OF MANGANESE FUME MAY CAUSE "METAL FUME FEVER" WITH SYMPTOMS OF CHILLS, FEVER, NAUSEA, COUGH, DRY THROAT, WEAKNESS, MUSCLE ACHES, AND A SWEET OR METALLIC TASTE IN THE MOUTH. PROLONGED OR REPEATED EXPOSURE MAY AFFECT THE NERVOUS SYSTEM, WITH DIFFICULTY IN WALKING AND BALANCING, WEAKNESS OR CRAMPS IN THE LEGS, HOARSENESS OF THE VOICE, TROUBLE WITH MEMORY OR JUDGEMENT, UNSTABLE EMOTIONS OR UNUSUAL IRRITABILITY. THE RESPIRATORY SYSTEM MAY ALSO BE AFFECTED BY A PNEUMONIA LIKE ILLNESS WITH SYMPTOMS OF COUGHING, FEVER, CHILLS, BODY ACHE, CHEST PAIN AND OTHER COMMON SIGNS OF PNEUMONIA.

MOLYBDENUM: OXIDES OF MOLYBDENUM HAVE CAUSED IRRITATION OF THE EYES, NOSE, AND THROAT, WEIGHT LOSS, AND DIGESTIVE DISTURBANCES IN EXPERIMENTAL ANIMALS.

NICKEL: FUMES ARE RESPIRATORY IRRITANTS AND MAY CAUSE RESPIRATORY DISEASE. SKIN CONTACT CAN ALSO CAUSE AN ALLERGIC SKIN RASH. NICKEL AND ITS COMPOUNDS HAVE BEEN REPORTED TO CAUSE CANCER OF THE LUNGS AND SINUSES.

TANTALUM: GENERALLY CONSIDERED TO HAVE A LOW ORDER OF TOXICITY BUT HAS PRODUCED TRANSIENT LESIONS OF THE LUNGS IN EXPERIMENTAL ANIMALS.

TIN: GENERALLY CONSIDERED TO EXHIBIT A LOW ORDER OF TOXICITY. MAY CAUSE IRRITATION OF THE EYES, NOSE, THROAT AND SKIN.

TITANIUM DIOXIDE: CONSIDERED TO BE A "NUISANCE" PARTICULATE. CAN CAUSE IRRITATION OF THE EYES, NOSE, AND THROAT IN HIGH CONCENTRATIONS. SLIGHT LUNG CHANGES MAY OCCUR.

***TUNGSTEN:** METAL AND INSOLUBLE COMPOUNDS ARE GENERALLY CONSIDERED TO HAVE A LOW ORDER OF TOXICITY, BUT HAVE PRODUCED LUNG CHANGES IN EXPERIMENTAL ANIMALS.

VANADIUM PENTOXIDE: DUST AND FUME MAY CAUSE IRRITATION OF THE EYES, NOSE, THROAT, AND RESPIRATORY TRACT. IT MAY ALSO CAUSE BRONCHITIS WITH WHEEZING AND CHEST PAIN. A GREENISH DISCOLORATION OF THE TONGUE MAY OCCUR. AFTER SYMPTOMS HAVE OCCURRED FOLLOWING INITIAL EXPOSURE, REPEATED EXPOSURE MAY CAUSE MORE SEVERE SYMPTOMS OF THE SAME NATURE. REPEATED EXPOSURES MAY CAUSE CHRONIC BRONCHITIS, OR ALLERGIC SKIN RASH.

ZIRCONIUM: GENERALLY CONSIDERED TO HAVE A LOW ORDER OF TOXICITY. SKIN RASH HAS BEEN REPORTED FROM EXPOSURE TO ZIRCONIUM CONTAINING DEODORANTS.

REFERENCES: HEALTH HAZARD DATA FOR THE ELEMENTS MARKED WITH AN (*) WAS TAKEN FROM ACGIH'S DOCUMENTATION OF TLV'S. HEALTH HAZARD DATA FOR THE REMAINING ELEMENTS WAS TAKEN FROM THE NIOSH / OSHA OCCUPATIONAL HEALTH GUIDELINES FOR CHEMICAL HAZARDS. FOR ADDITIONAL SOURCES OF INFORMATION ON POTENTIAL HEALTH EFFECTS OF THESE SUBSTANCES, PLEASE REFER TO OSHA'S HAZARD COMMUNICATION STANDARD (29 CFR 1910.1200) APPENDIX C.

CARCINOGENIC REFERENCES: CHROMIUM, COBALT-CHROMIUM ALLOYS, AND NICKEL HAVE BEEN IDENTIFIED BY THE INTERNATIONAL AGENCY FOR RESEARCH ON CANCER (IARC) AND / OR THE NATIONAL TOXICOLOGY PROGRAM (NTP) AS POTENTIAL CANCER CAUSING AGENTS.

EXPOSURE ROUTES:

EXPOSURE TO SPECIALTY STEEL ALLOYS OCCURS PRIMARILY FROM INHALATION OF DUST OR FUMES. HOWEVER, CONSTITUENTS OF THESE ALLOYS MAY CAUSE EFFECTS DIRECTLY UPON THE SKIN OR EYES. CERTAIN CONSTITUENTS MAY ALSO BE HARMFUL IF SWALLOWED.

FIRST AID:

INHALATION - MOVE PERSON TO FRESH AIR UNTIL RECOVERED, CONSULT A PHYSICIAN.

SKIN - WASH WITH WATER AND MILD DETERGENT, CONSULT A PHYSICIAN.

EYE - FLUSH THOROUGHLY WITH WATER, CONSULT A PHYSICIAN.

INGESTION - WHILE INGESTION OF LARGE ENOUGH QUANTITIES TO CAUSE HEALTH EFFECTS IS UNLIKELY, CONSULT A PHYSICIAN IF IT OCCURS.

SECTION VI - REACTIVITY

STABILITY: STABLE

INCOMPATIBLE MATERIALS: NONE

HAZARDOUS DECOMPOSITION: NONE

POLYMERIZATION: WILL NOT OCCUR

SECTION VII - SPILL OR LEAK PROCEDURES

PRODUCT IS A SOLID METAL AS SHIPPED. NO POTENTIAL FOR SPILL OR LEAK.

SECTION VIII - SPECIAL PROTECTION INFORMATION

VENTILATION:

IF YOUR PROCESS CAUSES A RELEASE OF DUST OR FUME, USE LOCAL AND GENERAL EXHAUST VENTILATION TO KEEP AIRBORN CONCENTRATIONS OF DUST OR FUMES BELOW THE TLV.

RESPIRATORY PROTECTION:

IF YOUR PROCESS CAUSES A RELEASE OF DUST OR FUME IN EXCESS OF THE PERMISSIBLE EXPOSURE LIMIT, NIOSH APPROVED RESPIRATORS FOR PROTECTION AGAINST AIRBORN DUST OR FUMES SHOULD BE WORN. RESPIRATORS SHOULD BE USED IN ACCORDANCE WITH 29CFR 1910.134.

PROTECTIVE EQUIPMENT:

GLOVES AND BARRIER CREAMS MAY BE NECESSARY TO PREVENT SKIN SENSITIZATION AND DERMATITIS. IF YOUR PROCESS INVOLVES GRINDING OR ANY OTHER ACTION THAT CAUSES THE RELEASE OF DUST OR FUMES, APPROVED SAFETY GLASSES OR GOGGLES SHOULD BE WORN.

SECTION IX - SPECIAL PRECAUTIONS

NONE

DATE OF PREP. 8/12/86

QUICK COLOR

PAGE 1

SECTION 1

GLOSS WHITE

MANUFACTURER: SEYMOUR OF SYCAMORE, INC. 917 CROSBY AVE., SYCAMORE, IL. 60178
EMERGENCY TELEPHONE NO. 815-895-9101

TRADE NAME: QUICK COLOR GLOSS WHITE
PRODUCT CLASS: AEROSOL - VINYL TOLUENE ALKYD ENAMEL
MANUFACTURERS CODE IDENTIFICATION: 00-0011-0002

11-2

SECTION 2 - HAZARDOUS INGREDIENTS

INGREDIENT - (CAS#)	PERCENT	ACGIH TLV(TWA)/OSHA PEL		VAPOR PRESSURE AEROSOL CANS 40 P.S.I. @ 70 DEG. F
		PPM	MG/M3	
TITANIUM DIOXIDE (13463-67-7) (AS DUST)	4.36	ND	15.0	ND
METHYLENE CHLORIDE (75-09-2)	34.16	100.0	350.0	13.00
TOLUENE (108-88-3)	10.21	100.0	375.0	1.27
MINERAL SPIRITS (64742-86-7)	.12	ND	ND	.70
VARNISH MAKERS & PAINTER NAPHTHA (8030-30-6)	4.84	300.0	1,350.0	1.10
XYLENE (1330-20-7)	3.97	100.0	435.0	1.00
PROPANE - (74-98-6)	21.0	ND	ND	2.30
ISOBUTANE - (75-28-5)	14.0	ND	ND	1.90

MATERIAL	8-HOUR TIME WEIGHTED AVERAGE	ACCEPTABLE CEILING CONCENTRATION	ACCEPTABLE MAXIMUM PEAK ABOVE THE ACCEPTANCE CEILING CONCENTRATION FOR AN 8-HOUR SHIFT	
			CONCENTRATION	MAXIMUM DURATION
METHYLENE CHLORIDE	500 PPM	1,000 PPM	2,000 PPM	5 MINUTES IN ANY 2 HOURS.
TOLUENE	200 PPM	300 PPM	500 PPM	10 MINUTES.

SECTION 3 - PHYSICAL DATA

BOILING POINT: NA VAPOR DENSITY: HEAVIER THAN AIR

EVAPORATION RATE: FASTER THAN ETHER. PERCENT VOLATILE BY VOLUME: 85X WEIGHT PER GALLON: NA

SECTION 4 - FIRE AND EXPLOSION DATA

FLASH POINT: AEROSOL-10 DEG. F (T.O.C.) LEL: SEE SECTION 2

FLAMMABILITY CLASSIFICATION: NA

DOT: CONSUMER COMMODITY ORMD

EXTINGUISHING MEDIA: USE CARBON DIOXIDE, DRY CHEMICAL OR FOAM.

QUICK COLOR PRODUCTS
MSDS NUMBER - 0000-0000
APPROVED BY: _____
DATE: _____
PURCHASER: _____

QUICK COLOR GLOSS WHITE

UNUSUAL FIRE AND EXPOSITION HAZARDS: EXPOSURE TO HEAT MAY CAUSE BURSTING OF AEROSOL CAN.

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SPECIAL FIRE FIGHTING PROCEDURES: WATER SPRAY MAY BE INEFFECTIVE. WATER MAY BE USED TO COOL CONTAINERS TO PREVENT BURSTING. IF WATER IS USED, FOG NOZZLES ARE PREFERABLE. WEAR GOGGLES AND SELF CONTAINED BREATHING APPARATUS.

SECTION 5 - HEALTH HAZARD

THRESHOLD LIMIT VALUE: SEE SECTION 2

TITANIUM DIOXIDE

(13463-67-7) (AS DUST)

OVEREXPOSURE - NONE KNOWN

NOTE: INHALATION TESTS IN RATS: DUST FROM DRIED PRODUCTS PRODUCED AN INERT OR NUISANCE DUST RESPONSE IN THE LUNGS.

METHYLENE CHLORIDE

(75-09-2)

ACUTE OVEREXPOSURE - INHALATION OF VAPORS CAN CAUSE HEADACHE, DIZZINESS AND STUPOR, NAUSEA, AND VOMITING. SEVERE OVEREXPOSURE MAY CAUSE MUSCULAR INCOORDINATION, UNCONCIOUSNESS, AND DEATH.

INHALATION - IRRITATES RESPIRATORY TRACT.

SKIN CONTACT - MILDLY IRRITATING TO SKIN. SKIN CONTACT MAY PRODUCE A BURNING SENSATION. PROLONGED OR REPEATED CONTACT MAY CAUSE SKIN TO BECOME RED, ROUGH AND DRY DUE TO THE REMOVAL OF NATURAL OILS AND MAY RESULT IN DERMATITIS.

SKIN ABSORPTION - RAPIDLY ABSORBED THROUGH THE SKIN.

EYE CONTACT - AN IRRITANT OF THE EYES CAUSING PAIN, AND GENERAL INFLAMMATION.

INGESTION - IT CAN IRRITATE THE GASTROINTESTINAL TRACT. IT COULD PRODUCE CHEMICAL PNEUMONIA IF VOMITING RESULTS IN ASPIRATION INTO THE LUNGS. IT MAY ULTIMATELY RESULT IN UNCONSCIOUSNESS AND EVEN DEATH.

CHRONIC OVEREXPOSURE - CAN CAUSE HEADACHE, MENTAL CONFUSION, FATIGUE, LOSS OF APPETITE, NAUSEA, VOMITING, COUGH, LOSS OF SENSE OF BALANCE, AND VISUAL DISTURBANCES. PROLONG OR REPEATED SKIN CONTACT MAY CAUSE DERMATITIS.

IT IS CONCLUDED TO BE AN ANIMAL CARCINOGEN BASED ON LABORATORY STUDIES OF RATS AND MICE AT HIGH LEVELS OF EXPOSURE. THERE IS NO DATA SHOWING A RELATIONSHIP BETWEEN THESE STUDIES AND THE POTENTIAL AS A HUMAN CARCINOGEN. EXCESSIVE EXPOSURE MAY CAUSE CENTRAL NERVOUS SYSTEM, LIVER AND KIDNEY EFFECTS.

FIRST AID:

EYE CONTACT - IMMEDIATELY FLUSH WITH LARGE AMOUNTS OF WATER FOR AT 15 MINUTES, HOLDING LIDS APART TO ENSURE FLUSHING OF THE ENTIRE EYE SURFACE.

SEEK MEDICAL ATTENTION IMMEDIATELY.

SKIN CONTACT - WASH CONTAMINATED AREA WITH SOAP AND WATER. A SOOTHING DINTMENT MAY BE APPLIED TO IRRITATED SKIN AFTER CLEANSING. REMOVE

CONTAMINATED CLOTHING AND FOOTWEAR AND WASH CLOTHING BEFORE REUSE. DISCARD FOOTWEAR WHICH CANNOT BE DECONTAMINATED. SEEK MEDICAL ATTENTION.

INHALATION - GET PERSON OUT OF CONTAMINATED AREA TO FRESH AIR. IF

BREATHING HAS STOPPED ARTIFICIAL RESPIRATION SHOULD BE STARTED. OXYGEN MAY BE ADMINISTERED, IF READILY AVAILABLE. SEEK MEDICAL ATTENTION IMMEDIATELY.

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INGESTION - IF SWALLOWED DO NOT INDUCE VOMITING. IF VOMITING OCCURS SPONTANEOUSLY, POSITION INDIVIDUAL'S HEAD TO KEEP AIRWAY CLEAR. NEVER GIVE ANYTHING BY MOUTH TO AN UNCONCIOUS PERSON. SEEK MEDICAL ATTENTION IMMEDIATELY.

**QUICK
COLOR
GLASS
WHITE**

7 TOLUENE

3 (108-88-3)

4 ACUTE OVEREXPOSURE -

5 OVEREXPOSURE CAN LEAD TO CENTRAL NERVOUS SYSTEM
6 DEPRESSION PRODUCING SUCH EFFECTS AS HEADACHE, DIZZINESS, NAUSEA, AND LOSS
7 OF CONSCIOUSNESS.

8 EYE CONTACT - SHORT-TERM LIQUID OR VAPOR CONTACT MAY RESULT IN SLIGHT EYE
9 IRRITATION. PROLONGED AND REPEATED CONTACT MAY BE MORE IRRITATING.

10 SKIN CONTACT - PROLONGED AND REPEATED LIQUID CONTACT CAN CAUSE DEFATTING
11 AND DRYING OF THE SKIN WHICH MAY RESULT IN SKIN IRRITATION AND DERMATITIS.

12 INHALATION - HIGH CONCENTRATIONS OR PROLONGED TO LOWER CONCENTRATIONS MAY
13 BE SLIGHTLY IRRITATING TO MUCOUS MEMBRANES.

14 INGESTION - LIQUID INGESTION MAY RESULT IN VOMITING; ASPIRATION
15 (BREATHING) OF VOMITUS INTO THE LUNGS MUST BE AVOIDED AS EVEN SMALL
16 QUANTITIES IN THE LUNGS MAY RESULT IN CHEMICAL PNEUMONITIS AND PULMONARY
17 EDEMA/HEMORRHAGE.

18 CHRONIC OVEREXPOSURE - RESPIRATORY TRACT IRRITATION.

19 CENTRAL NERVOUS SYSTEM DEPRESSION IN HIGH CONCENTRATIONS.

20 LIVER AND KIDNEY DAMAGE.

21 BRAIN CELL DAMAGE MAY RESULT FROM LONG TERM INHALATION OF TOLUENE VAPOR.

22 ANIMAL STUDIES HAVE SHOWN THAT INHALATION OF HIGH LEVELS OF TOLUENE PRODUCED
23 CARDIAC SENSITIZATION. SUCH SENSITIZATION MAY CAUSE FATAL CHANGES IN HEART
24 RHYTHMS. RATS EXPOSED TO 1400 PPM OR 1200 PPM OF TOLUENE FOR 14 HOURS PER
25 DAY FOR 4 TO 5 WEEKS (RESPECTIVELY) EXHIBITED HIGH FREQUENCY HEARING
26 DEFECTS. THERE IS NO EVIDENCE THAT INDUSTRIALLY ACCEPTED LEVELS OF TOLUENE
27 VAPORS (E.G. THE TLV) HAVE PRODUCED CARDIAC EFFECTS IN HUMANS.

28 FIRST AID:

29
30 EYE CONTACT - FLUSH WITH WATER FOR 15 MINUTES WHILE HOLDING EYELIDS OPEN.
31 GET MEDICAL ATTENTION.

32 SKIN CONTACT - FLUSH WITH WATER WHILE REMOVING CONTAMINATED CLOTHING AND
33 SHOES. FOLLOW BY WASHING WITH SOAP AND WATER. DO NOT REUSE CLOTHING OR
34 SHOES UNTIL CLEANED. IF IRRITATION PERSISTS, GET MEDICAL ATTENTION.

35 INHALATION - REMOVE VICTIM TO FRESH AIR AND PROVIDE OXYGEN IF BREATHING
36 IS DIFFICULT. GIVE ARTIFICIAL RESPIRATION IF NOT BREATHING. GET MEDICAL
37 ATTENTION.

38 INGESTION - DO NOT INDUCE VOMITING. IF VOMITING OCCURS SPONTANEOUSLY, KEEP
39 HEAD BELOW HIPS TO PREVENT ASPIRATION OF LIQUID INTO THE LUNGS. GET
40 MEDICAL ATTENTION.

41
42 MINERAL SPIRITS

43 (64742-86-7)

44 ACUTE OVEREXPOSURE - CAN LEAD TO CENTRAL NERVOUS SYSTEM DEPRESSION PRODUC-
45 ING SUCH EFFECTS AS HEADACHE, DIZZINESS, NAUSEA, AND LOSS OF CONSCIOUSNESS.

46 EYE CONTACT - SHORT TERM LIQUID OR VAPOR CONTACT MAY RESULT IN SLIGHT EYE
47 IRRITATION. PROLONGED AND REPEATED CONTACT MAY BE MORE IRRITATING.

48 SKIN CONTACT - PROLONGED AND REPEATED LIQUID CONTACT CAN CAUSE DEFATTING
49 AND DRYING OF THE SKIN WHICH MAY RESULT IN SKIN IRRITATION AND DERMATITIS.

50 INHALATION - HIGH CONCENTRATIONS OR PROLONGED EXPOSURE TO LOWER CONCENTRA-
51 TIONS MAY BE SLIGHTLY IRRITATING TO MUCOUS MEMBRANES.

52 INGESTION - LIQUID INGESTION MAY RESULT IN VOMITING; ASPIRATION (BREATHING
53 IN) OF LIQUID MUST BE AVOIDED AS LIQUID CONTACT WITH THE LUNGS CAN RESULT
54 IN CHEMICAL PNEUMONITIS AND PULMONARY EDEMA/HEMORRHAGE.

QUICK COLOR GLOSS WHITE

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FIRST AID:

EYE CONTACT - FLUSH WITH WATER. IF PERSISTENT IRRITATION OCCURS, GET MEDICAL ATTENTION.
SKIN CONTACT - WASH WITH SOAP AND WATER. REMOVE CONTAMINATED CLOTHING AND DO NOT REUSE UNTIL LAUNDERED. IF PERSISTENT IRRITATION OCCURS, GET MEDICAL ATTENTION.
INHALATION - REMOVE TO FRESH AIR AND PROVIDE OXYGEN IF BREATHING IS DIFFICULT. GIVE ARTIFICIAL RESPIRATION IF NOT BREATHING. GET MEDICAL ATTENTION.
INGESTION - DO NOT INDUCE VOMITING EVEN THOUGH VOMITING MAY OCCUR. IF VOMITING OCCURS, KEEP HEAD BELOW HIPS TO PREVENT ASPIRATION OF LIQUID INTO THE LUNGS. GET MEDICAL ATTENTION.

VARNISH MAKERS & PAINTER

NAPHTHA (8030-30-6)

ACUTE OVEREXPOSURE - CENTRAL NERVOUS SYSTEM DEPRESSION IN HIGH CONCENTRATIONS.
EYE CONTACT - MAY BE AN EYE IRRITANT.
SKIN CONTACT - PROLONGED OR REPEATED CONTACT MAY CAUSE SKIN IRRITATION.

FIRST AID:

EYE CONTACT - FLUSH EYES WITH LARGE QUANTITIES OF WATER FOR AT LEAST 15 MINUTES AND SEEK IMMEDIATE MEDICAL ATTENTION.
SKIN CONTACT - WASH AFFECTED AREA WITH SOAP AND LARGE QUANTITIES OF WATER. WASH CONTAMINATED CLOTHING BEFORE REUSE.
INHALATION - IF BREATHING DIFFICULTIES, DIZZINESS, OR LIGHTEADEDNESS OCCUR WHEN WORKING IN AREAS WITH HIGH VAPOR CONCENTRATIONS, VICTIM SHOULD SEEK AIR FREE OF VAPORS. IF VICTIM EXPERIENCES CONTINUED BREATHING DIFFICULTIES, ADMINISTER OXYGEN UNTIL MEDICAL ASSISTANCE CAN BE RENDERED. IF BREATHING STOPS, BEGIN ARTIFICIAL RESPIRATION AND SEEK IMMEDIATE MEDICAL ATTENTION.
INGESTION - IF SWALLOWED, DO NOT INDUCE VOMITING. SEEK IMMEDIATE MEDICAL ADVICE AND/OR ATTENTION.

XYLENE

(1330-20-7)

ACUTE OVEREXPOSURE -

EYE CONTACT - MAY BE AN EYE IRRITANT.
SKIN CONTACT - MAY CAUSE SKIN IRRITATION UPON PROLONGED OR REPEATED CONTACT.
INHALATION - IRRITANT TO UPPER RESPIRATORY SYSTEM. CAN CAUSE HEADACHE, NAUSEA, AND DIZZINESS.
INGESTION - MAY BE HARMFUL IF SWALLOWED.
CHRONIC OVEREXPOSURE -
POSSIBLE LIVER AND KIDNEY DAMAGE.

FIRST AID:

EYE CONTACT - FLUSH EYES WITH LARGE QUANTITIES OF WATER FOR AT LEAST 15 MINUTES AND SEEK IMMEDIATE MEDICAL ATTENTION.
SKIN CONTACT - WASH SKIN WITH SOAP AND LARGE QUANTITIES OF WATER AND SEEK MEDICAL ATTENTION IF IRRITATION FROM CONTACT PERSISTS.
INHALATION - IF BREATHING DIFFICULTIES, DIZZINESS, OR LIGHTEADEDNESS OCCUR WHEN WORKING IN AREAS WITH HIGH VAPOR CONCENTRATIONS, VICTIM SHOULD SEEK AIR FREE OF VAPORS. IF VICTIM EXPERIENCES CONTINUED BREATHING DIFFICULTIES, ADMINISTER OXYGEN UNTIL MEDICAL ASSISTANCE CAN BE RENDERED. IF BREATHING STOPS, BEGIN ARTIFICIAL RESPIRATION AND SEEK IMMEDIATE MEDICAL ATTENTION.
INGESTION - IF SWALLOWED, DO NOT INDUCE VOMITING. SEEK IMMEDIATE MEDICAL ADVICE AND/OR ATTENTION.

QUM COLOR GLASS
WHITE

SECTION 6 - REACTIVITY DATA

STABILITY: STABLE CONDITIONS TO AVOID: DO NOT STORE ABOVE
120 DEG. F. KEEP FROM SPARKS, PILOT LIGHTS OR OPEN FLAME.

INCOMPATABILITY: (MATERIALS TO AVOID) NONE KNOWN

HAZARDOUS DECOMPOSITION PRODUCTS: MAY PRODUCE HAZARDOUS FUMES WHEN HEATED
TO DECOMPOSITION. FUMES MAY CONTAIN CARBON DIOXIDE AND/OR CARBON MONOXIDE.
FUMES MAY ALSO CONTAIN HYDROGEN CHLORIDE VAPOR AND TRACES OF PHOSGENE.

HAZARDOUS POLYMERIZATION: WILL NOT OCCUR.

CONDITIONS TO AVOID: NA

SECTION 7 - SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: REMOVE ALL SOURCES OF
IGNITION, AVOID BREATHING VAPORS, VENTILATE AREA. WIPE UP WITH INERT MATERIALS
AND PLACE IN APPROPRIATE CONTAINER.

WASTE DISPOSAL METHODS: DO NOT INCINERATE AEROSOL, DISPOSE OF IN ACCORDANCE WITH
LOCAL, STATE AND FEDERAL REGULATIONS, DO NOT PLACE AEROSOL CANS IN HOME
COMPACTOR. DO NOT PUNCTURE.

SECTION 8 - SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION: AVOID CONTINUOUS BREATHING OF VAPORS AND SPRAY MIST.
A SELF CONTAINED BREATHING APPARATUS REQUIRED FOR CONCENTRATIONS ABOVE
TLV LIMITS.

VENTILATION: USE WITH ADEQUATE VENTILATION, SUFFICIENT TO PREVENT
INHALATION OF SOLVENT VAPORS.

PROTECTIVE GLOVES: OPTIONAL

EYE PROTECTION: ONLY UNDER CONDITIONS WHERE SPRAY MIST MIGHT GET INTO EYES.

SECTION 9 - SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING: DO NOT STORE ABOVE 120 DEG. F.
EXPOSURE TO HEAT OR PROLONG EXPOSURE TO SUN MAY CAUSE BURSTING.

OTHER PRECAUTIONS: USE ONLY AS DIRECTED. INTENTIONAL MISUSE BY DELIBERATELY
CONCENTRATING VAPORS AND INHALING CONTENTS CAN BE HARMFUL OR FATAL.

SYCAMORE

DATE OF PREP. 8/12/86

QUICK COLOR GLOSS

PAGE 1

SECTION 1

BLACK #11-3

MANUFACTURER: SEYMOUR OF SYCAMORE, INC. 917 CROSBY AVE., SYCAMORE, IL. 60178
EMERGENCY TELEPHONE NO. 815-895-9101

TRADE NAME: QUICK COLOR GLOSS BLACK
PRODUCT CLASS: AEROSOL - VINYL TOLUENE ALKYL ENAMEL
MANUFACTURERS CODE IDENTIFICATION: 00-0011-0003

SECTION 2 - HAZARDOUS INGREDIENTS

INGREDIENT - (CAS#)	ACGIH TLV(TWA)/OSHA PEL				VAPOR PRESSURE AEROSOL CANS 40 P.S.I. @ 70 DEG. F
	PERCENT	PPM	MG/M3	LEL	
METHYLENE CHLORIDE (75-09-2)	37.03	100.0	350.0	13.00	
	PEL - SEE BOTTOM OF SECTION 2.				
TOLUENE (108-88-3)	6.39	100.0	375.0	1.27	
	PEL - SEE BOTTOM OF SECTION 2.				
METHYL ISOBUTYL KETONE (108-10-1)	1.87	50.0	205.0	1.40	
		100	410		
MINERAL SPIRITS (64742-86-7)	.12	ND	ND	.70	
		ND	ND		
VARNISH MAKERS & PAINTER NAPHTHA (8030-30-6)	4.64	300.0	1,350.0	1.10	
		ND	ND		
XYLENE (1330-20-7)	4.08	100.0	435.0	1.00	
		100	435		
PROPANE - (74-98-6)	21.9	ND	ND	2.30	
		1000.0	1800.0		
ISOBUTANE - (75-28-5)	14.0	ND	ND	1.90	

MATERIAL	8-HOUR TIME WEIGHTED AVERAGE	ACCEPTABLE CEILING CONCENTRATION	ACCEPTABLE MAXIMUM PEAK ABOVE THE ACCEPTANCE CEILING CONCENTRATION FOR AN 8-HOUR SHIFT	
			CONCENTRATION	MAXIMUM DURATION
METHYLENE CHLORIDE	500 PPM	1,000 PPM	2,000 PPM	5 MINUTES IN ANY 2 HOURS.
TOLUENE	200 PPM	300 PPM	500 PPM	10 MINUTES.

SECTION 3 - PHYSICAL DATA

BOILING POINT: NA VAPOR DENSITY: HEAVIER THAN AIR

EVAPORATION RATE: FASTER THAN ETHER. PERCENT VOLATILE WEIGHT PER
BY VOLUME: BSX GALLON: NA

SECTION 4 - FIRE AND EXPLOSION DATA

FLASH POINT: AEROSOL-10 DEG. F (T.O.C.) LEL: SEE SECTION 2

FLAMMABILITY CLASSIFICATION: NA

DOT: CONSUMER COMMODITY OR MD

EXTINGUISHING MEDIA: USE CARBON DIOXIDE, DRY CHEMICAL OR FOAM.

COPIED FROM ORIGINAL
INSDS NUMBER 00011-0003
SHEET 1
PREFRASE 11-3

QUICK COLOR GLOSS BLACK

UNUSUAL FIRE AND EXPOSITION HAZARDS: EXPOSURE TO HEAT MAY CAUSE BURSTING OF AEROSOL CAN.

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11-3

SPECIAL FIRE FIGHTING PROCEDURES: WATER SPRAY MAY BE INEFFECTIVE. WATER MAY BE USED TO COOL CONTAINERS TO PREVENT BURSTING. IF WATER IS USED, FOG NOZZLES ARE PREFERABLE. WEAR GOGGLES AND SELF CONTAINED BREATHING APPARATUS.

SECTION 5 - HEALTH HAZARD

THRESHOLD LIMIT VALUE: SEE SECTION 2

METHYLENE CHLORIDE (75-09-2)

ACUTE OVEREXPOSURE - INHALATION OF VAPORS CAN CAUSE HEADACHE, DIZZINESS AND STUPOR, NAUSEA, AND VOMITING. SEVERE OVEREXPOSURE MAY CAUSE MUSCULAR INCOORDINATION, UNCONCIOUSNESS, AND DEATH.

INHALATION - IRRITATES RESPIRATORY TRACT.

SKIN CONTACT - MILDLY IRRITATING TO SKIN. SKIN CONTACT MAY PRODUCE A BURNING SENSATION. PROLONGED OR REPEATED CONTACT MAY CAUSE SKIN TO BECOME RED, ROUGH AND DRY DUE TO THE REMOVAL OF NATURAL OILS AND MAY RESULT IN DERMATITIS.

SKIN ABSORPTION - RAPIDLY ABSORBED THROUGH THE SKIN.

EYE CONTACT - AN IRRITANT OF THE EYES CAUSING PAIN, AND GENERAL INFLAMMATION.

INGESTION - IT CAN IRRITATE THE GASTROINTESTINAL TRACT. IT COULD PRODUCE CHEMICAL PNEUMONIA IF VOMITING RESULTS IN ASPIRATION INTO THE LUNGS. IT MAY ULTIMATELY RESULT IN UNCONCIOUSNESS AND EVEN DEATH.

CHRONIC OVEREXPOSURE - CAN CAUSE HEADACHE, MENTAL CONFUSION, FATIGUE, LOSS OF APPETITE, NAUSEA, VOMITING, COUGH, LOSS OF SENSE OF BALANCE, AND VISUAL DISTURBANCES. PROLONG OR REPEATED SKIN CONTACT MAY CAUSE DERMATITIS.

IT IS CONCLUDED TO BE AN ANIMAL CARCINOGEN BASED ON LABORATORY STUDIES OF RATS AND MICE AT HIGH LEVELS OF EXPOSURE. THERE IS NO DATA SHOWING A RELATIONSHIP BETWEEN THESE STUDIES AND THE POTENTIAL AS A HUMAN CARCINOGEN. EXCESSIVE EXPOSURE MAY CAUSE CENTRAL NERVOUS SYSTEM, LIVER AND KIDNEY EFFECTS.

FIRST AID:

EYE CONTACT - IMMEDIATELY FLUSH WITH LARGE AMOUNTS OF WATER FOR AT 15 MINUTES, HOLDING LIDS APART TO ENSURE FLUSHING OF THE ENTIRE EYE SURFACE. SEEK MEDICAL ATTENTION IMMEDIATELY.

SKIN CONTACT - WASH CONTAMINATED AREA WITH SOAP AND WATER. A SOOTHING OINTMENT MAY BE APPLIED TO IRRITATED SKIN AFTER CLEANSING. REMOVE CONTAMINATED CLOTHING AND FOOTWEAR AND WASH CLOTHING BEFORE REUSE. DISCARD FOOTWEAR WHICH CANNOT BE DECONTAMINATED. SEEK MEDICAL ATTENTION.

INHALATION - GET PERSON OUT OF CONTAMINATED AREA TO FRESH AIR. IF BREATHING HAS STOPPED ARTIFICIAL RESPIRATION SHOULD BE STARTED. OXYGEN MAY BE ADMINISTERED, IF READILY AVAILABLE. SEEK MEDICAL ATTENTION IMMEDIATELY.

INGESTION - IF SWALLOWED DO NOT INDUCE VOMITING. IF VOMITING OCCURS SPONTANEOUSLY, POSITION INDIVIDUAL'S HEAD TO KEEP AIRWAY CLEAR. NEVER GIVE ANYTHING BY MOUTH TO AN UNCONCIOUS PERSON. SEEK MEDICAL ATTENTION IMMEDIATELY.

TOLUENE (108-88-3)

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#11-3

**QUICK COLOR GLOSS
BLACK**

ACUTE OVEREXPOSURE -

OVEREXPOSURE CAN LEAD TO CENTRAL NERVOUS SYSTEM

DEPRESSION PRODUCING SUCH EFFECTS AS HEADACHE, DIZZINESS, NAUSEA, AND LOSS OF CONSCIOUSNESS.

EYE CONTACT - SHORT-TERM LIQUID OR VAPOR CONTACT MAY RESULT IN SLIGHT EYE IRRITATION. PROLONGED AND REPEATED CONTACT MAY BE MORE IRRITATING.

SKIN CONTACT - PROLONGED AND REPEATED LIQUID CONTACT CAN CAUSE DEFATTING AND DRYING OF THE SKIN WHICH MAY RESULT IN SKIN IRRITATION AND DERMATITIS.

INHALATION - HIGH CONCENTRATIONS OR PROLONGED TO LOWER CONCENTRATIONS MAY BE SLIGHTLY IRRITATING TO MUCOUS MEMBRANES.

INGESTION - LIQUID INGESTION MAY RESULT IN VOMITING; ASPIRATION

(BREATHING) OF VOMITUS INTO THE LUNGS MUST BE AVOIDED AS EVEN SMALL

QUANTITIES IN THE LUNGS MAY RESULT IN CHEMICAL PNEUMONITIS AND PULMONARY EDEMA/HEMORRHAGE.

CHRONIC OVEREXPOSURE - RESPIRATORY TRACT IRRITATION.

CENTRAL NERVOUS SYSTEM DEPRESSION IN HIGH CONCENTRATIONS.

LIVER AND KIDNEY DAMAGE.

BRAIN CELL DAMAGE MAY RESULT FROM LONG TERM INHALATION OF TOLUENE VAPOR.

ANIMAL STUDIES HAVE SHOWN THAT INHALATION OF HIGH LEVELS OF TOLUENE PRODUCED

CARDIAC SENSITIZATION. SUCH SENSITIZATION MAY CAUSE FATAL CHANGES IN HEART

RYTHMS. RATS EXPOSED TO 1400 PPM OR 1200 PPM OF TOLUENE FOR 14 HOURS PER

DAY FOR 4 TO 5 WEEKS (RESPECTIVELY) EXHIBITED HIGH FREQUENCY HEARING

DEFECTS. THERE IS NO EVIDENCE THAT INDUSTRIALLY ACCEPTED LEVELS OF TOLUENE

VAPORS (E.G. THE TLV) HAVE PRODUCED CARDIAC EFFECTS IN HUMANS.

FIRST AID:

EYE CONTACT - FLUSH WITH WATER FOR 15 MINUTES WHILE HOLDING EYELIDS OPEN. GET MEDICAL ATTENTION.

SKIN CONTACT - FLUSH WITH WATER WHILE REMOVING CONTAMINATED CLOTHING AND SHOES. FOLLOW BY WASHING WITH SOAP AND WATER. DO NOT REUSE CLOTHING OR SHOES UNTIL CLEANED. IF IRRITATION PERSISTS, GET MEDICAL ATTENTION.

INHALATION - REMOVE VICTIM TO FRESH AIR AND PROVIDE OXYGEN IF BREATHING IS DIFFICULT. GIVE ARTIFICIAL RESPIRATION IF NOT BREATHING. GET MEDICAL ATTENTION.

INGESTION - DO NOT INDUCE VOMITING. IF VOMITING OCCURS SPONTANEOUSLY, KEEP HEAD BELOW HIPS TO PREVENT ASPIRATION OF LIQUID INTO THE LUNGS. GET MEDICAL ATTENTION.

METHYL ISOBUTYL KETONE

(108-10-1)

ACUTE OVEREXPOSURE -

EYE CONTACT - VAPOR AND LIQUID MAY BE IRRITATING TO EYES,

SKIN CONTACT - PROLONG OR REPEATED CONTACT MAY CAUSE DRYING, CRACKING, OR IRRITATION OF THE SKIN.

INHALATION - HIGH CONCENTRATION OF VAPOR MAY CAUSE HEADACHE, WEAKNESS, GASTROINTESTINAL UPSET, AND NARCOSIS (SLEEPINESS, DIZZINESS, ETC.).

CHRONIC EXPOSURE - NONE CURRENTLY KNOWN. (SEE NOTE)

FIRST AID:

EYE CONTACT - IMMEDIATELY FLUSH EYES WITH PLENTY OF WATER FOR AT LEAST 15 MINUTES AND GET MEDICAL ATTENTION IF ANY SYMPTOMS ARE PRESENT AFTER WASHING.

SKIN CONTACT - IMMEDIATELY FLUSH WITH PLENTY OF WATER FOR AT LEAST 15 MINUTES WHILE REMOVING CONTAMINATED CLOTHING AND SHOES AND GET MEDICAL ATTENTION IF SYMPTOMS ARE PRESENT AFTER WASHING.

INHALATION - VAPORS ARE IRRITATING TO EYES, NOSE, AND THROAT. REMOVE FROM EXPOSURE, TREAT SYMPTOMATICALLY, AND GET MEDICAL ATTENTION.

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P. 4 of 6

NOTE: IN HUMANS. LEVELS OF 1000 PPM PRODUCE CNS DEPRESSION AND NARCOSIS. WORKERS EXPOSED TO MINK AT CONCENTRATIONS UP TO 500 PPM, 30 MINUTES PER DAY OVER 5 YEARS COMPLAINED OF HEADACHE, WEAKNESS, EYE AND UPPER RESPIRATORY TRACT IRRITATION, AND GASTROINTESTINAL SYMPTOMS. AT 200-400 PPM, EYE, NOSE, AND THROAT IRRITATIONS OCCURS WHILE AT 100 PPM, THE ONLY PROBLEM OBSERVED IS AN OBJECTIONABLE ODOR.

MINERAL SPIRITS
(64742-86-7)

ACUTE OVEREXPOSURE - CAN LEAD TO CENTRAL NERVOUS SYSTEM DEPRESSION PRODUCING SUCH EFFECTS AS HEADACHE, DIZZINESS, NAUSEA, AND LOSS OF CONSCIOUSNESS.
EYE CONTACT - SHORT TERM LIQUID OR VAPOR CONTACT MAY RESULT IN SLIGHT EYE IRRITATION. PROLONGED AND REPEATED CONTACT MAY BE MORE IRRITATING.
SKIN CONTACT - PROLONGED AND REPEATED LIQUID CONTACT CAN CAUSE DEFATTING AND DRYING OF THE SKIN WHICH MAY RESULT IN SKIN IRRITATION AND DERMATITIS.
INHALATION - HIGH CONCENTRATIONS OR PROLONGED EXPOSURE TO LOWER CONCENTRATIONS MAY BE SLIGHTLY IRRITATING TO MUCOUS MEMBRANES.
INGESTION - LIQUID INGESTION MAY RESULT IN VOMITING; ASPIRATION (BREATHING IN) OF LIQUID MUST BE AVOIDED AS LIQUID CONTACT WITH THE LUNGS CAN RESULT IN CHEMICAL PNEUMONITIS AND PULMONARY EDEMA/HEMORRHAGE.

FIRST AID:

EYE CONTACT - FLUSH WITH WATER. IF PERSISTENT IRRITATION OCCURS, GET MEDICAL ATTENTION.
SKIN CONTACT - WASH WITH SOAP AND WATER. REMOVE CONTAMINATED CLOTHING AND DO NOT REUSE UNTIL LAUNDERED. IF PERSISTENT IRRITATION OCCURS, GET MEDICAL ATTENTION.
INHALATION - REMOVE TO FRESH AIR AND PROVIDE OXYGEN IF BREATHING IS DIFFICULT. GIVE ARTIFICIAL RESPIRATION IF NOT BREATHING. GET MEDICAL ATTENTION.
INGESTION - DO NOT INDUCE VOMITING EVEN THOUGH VOMITING MAY OCCUR. IF VOMITING OCCURS, KEEP HEAD BELOW HIPS TO PREVENT ASPIRATION OF LIQUID INTO THE LUNGS. GET MEDICAL ATTENTION.

VARNISH MAKERS & PAINTER
NAPHTHA (8030-30-6)

ACUTE OVEREXPOSURE - CENTRAL NERVOUS SYSTEM DEPRESSION IN HIGH CONCENTRATIONS.
EYE CONTACT - MAY BE AN EYE IRRITANT.
SKIN CONTACT - PROLONGED OR REPEATED CONTACT MAY CAUSE SKIN IRRITATION.

FIRST AID:

EYE CONTACT - FLUSH EYES WITH LARGE QUANTITIES OF WATER FOR AT LEAST 15 MINUTES AND SEEK IMMEDIATE MEDICAL ATTENTION.
SKIN CONTACT - WASH AFFECTED AREA WITH SOAP AND LARGE QUANTITIES OF WATER. WASH CONTAMINATED CLOTHING BEFORE REUSE.
INHALATION - IF BREATHING DIFFICULTIES, DIZZINESS, OR LIGHTEADEDNESS OCCUR WHEN WORKING IN AREAS WITH HIGH VAPOR CONCENTRATIONS, VICTIM SHOULD SEEK AIR FREE OF VAPORS. IF VICTIM EXPERIENCES CONTINUED BREATHING DIFFICULTIES, ADMINISTER OXYGEN UNTIL MEDICAL ASSISTANCE CAN BE RENDERED. IF BREATHING STOPS, BEGIN ARTIFICIAL RESPIRATION AND SEEK IMMEDIATE MEDICAL ATTENTION.
INGESTION - IF SWALLOWED, DO NOT INDUCE VOMITING. SEEK IMMEDIATE MEDICAL ADVICE AND/OR ATTENTION.

XYLENE
(1330-20-7)

ACUTE OVEREXPOSURE -
EYE CONTACT - MAY BE AN EYE IRRITANT.

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COLOR

#11-3

SKIN CONTACT - MAY CAUSE SKIN IRRITATION UPON PROLONGED OR REPEATED CONTACT.

INHALATION - IRRITANT TO UPPER RESPIRATORY SYSTEM. CAN CAUSE HEADACHE, NAUSEA, AND DIZZINESS.

INGESTION - MAY BE HARMFUL IF SWALLOWED.

CHRONIC OVEREXPOSURE -
POSSIBLE LIVER AND KIDNEY DAMAGE.

FIRST AID:

EYE CONTACT - FLUSH EYES WITH LARGE QUANTITIES OF WATER FOR AT LEAST 15 MINUTES AND SEEK IMMEDIATE MEDICAL ATTENTION.

SKIN CONTACT - WASH SKIN WITH SOAP AND LARGE QUANTITIES OF WATER AND SEEK MEDICAL ATTENTION IF IRRITATION FROM CONTACT PERSISTS.

INHALATION - IF BREATHING DIFFICULTIES, DIZZINESS, OR LIGHTEADEDNESS OCCUR WHEN WORKING IN AREAS WITH HIGH VAPOR CONCENTRATIONS, VICTIM SHOULD SEEK AIR FREE OF VAPORS. IF VICTIM EXPERIENCES CONTINUED BREATHING DIFFICULTIES, ADMINISTER OXYGEN UNTIL MEDICAL ASSISTANCE CAN BE RENDERED. IF BREATHING STOPS, BEGIN ARTIFICIAL RESPIRATION AND SEEK IMMEDIATE MEDICAL ATTENTION.
INGESTION - IF SWALLOWED, DO NOT INDUCE VOMITING. SEEK IMMEDIATE MEDICAL ADVICE AND/OR ATTENTION.

SECTION 6 - REACTIVITY DATA

STABILITY: STABLE CONDITIONS TO AVOID: DO NOT STORE ABOVE 120 DEG. F. KEEP FROM SPARKS, PILOT LIGHTS OR OPEN FLAME.

INCOMPATIBILITY: (MATERIALS TO AVOID) NONE KNOWN

HAZARDOUS DECOMPOSITION PRODUCTS: MAY PRODUCE HAZARDOUS FUMES WHEN HEATED TO DECOMPOSITION. FUMES MAY CONTAIN CARBON DIOXIDE AND/OR CARBON MONOXIDE. FUMES MAY ALSO CONTAIN HYDROGEN CHLORIDE VAPOR AND TRACES OF PHOSGENE.

HAZARDOUS POLYMERIZATION: WILL NOT OCCUR.

CONDITIONS TO AVOID: NA

SECTION 7 - SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: REMOVE ALL SOURCES OF IGNITION, AVOID BREATHING VAPORS, VENTILATE AREA. WIPE UP WITH INERT MATERIALS AND PLACE IN APPROPRIATE CONTAINER.

WASTE DISPOSAL METHODS: DO NOT INCINERATE AEROSOL, DISPOSE OF IN ACCORDANCE WITH LOCAL, STATE AND FEDERAL REGULATIONS. DO NOT PLACE AEROSOL CANS IN HOME COMPACTOR. DO NOT PUNCTURE.

SECTION 8 - SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION: AVOID CONTINUOUS BREATHING OF VAPORS AND SPRAY MIST. A SELF CONTAINED BREATHING APPARATUS REQUIRED FOR CONCENTRATIONS ABOVE TLV LIMITS.

VENTILATION: USE WITH ADEQUATE VENTILATION, SUFFICIENT TO PREVENT INHALATION OF SOLVENT VAPORS.

PROTECTIVE GLOVES: OPTIONAL

EYE PROTECTION: ONLY UNDER CONDITIONS WHERE SPRAY MIST MIGHT GET INTO EYES.

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SECTION 9 - SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING: DO NOT STORE ABOVE 120 DEG. F.
EXPOSURE TO HEAT OR PROLONG EXPOSURE TO SUN MAY CAUSE BURSTING.

OTHER PRECAUTIONS: USE ONLY AS DIRECTED. INTENTIONAL MISUSE BY DILIBERATELY
CONCENTRATING VAPORS AND INHALING CONTENTS CAN BE HARMFUL OR FATAL.

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QUICK COLOR GLOSS RED

SPECIAL FIRE FIGHTING PROCEDURES: WATER SPRAY MAY BE INEFFECTIVE. WATER MAY BE USED TO COOL CONTAINERS TO PREVENT BURSTING. IF WATER IS USED, FOG NOZZLES ARE PREFERABLE. WEAR GOGGLES AND SELF CONTAINED BREATHING APPARATUS.

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SECTION 5 - HEALTH HAZARD

THRESHOLD LIMIT VALUE: SEE SECTION 2

TITANIUM DIOXIDE

(13463-67-7) (AS DUST)

OVEREXPOSURE - NONE KNOWN

NOTE: INHALATION TESTS IN RATS: DUST FROM DRIED PRODUCTS PRODUCED AN INERT OR NUISANCE DUST RESPONSE IN THE LUNGS.

METHYLENE CHLORIDE

(75-09-2)

ACUTE OVEREXPOSURE - INHALATION OF VAPORS CAN CAUSE HEADACHE, DIZZINESS AND STUPOR, NAUSEA, AND VOMITING. SEVERE OVEREXPOSURE MAY CAUSE MUSCULAR INCOORDINATION, UNCONCIOUSNESS, AND DEATH.

INHALATION - IRRITATES RESPIRATORY TRACT.

SKIN CONTACT - MILDLY IRRITATING TO SKIN. SKIN CONTACT MAY PRODUCE A BURNING SENSATION. PROLONGED OR REPEATED CONTACT MAY CAUSE SKIN TO BECOME RED, ROUGH AND DRY DUE TO THE REMOVAL OF NATURAL OILS AND MAY RESULT IN DERMATITIS.

SKIN ABSORPTION - RAPIDLY ABSORBED THROUGH THE SKIN.

EYE CONTACT - AN IRRITANT OF THE EYES CAUSING PAIN, AND GENERAL INFLAMMATION.

INGESTION - IT CAN IRRITATE THE GASTROINTESTINAL TRACT. IT COULD PRODUCE CHEMICAL PNEUMONIA IF VOMITING RESULTS IN ASPIRATION INTO THE LUNGS. IT MAY ULTIMATELY RESULT IN UNCONSCIOUSNESS AND EVEN DEATH.

CHRONIC OVEREXPOSURE - CAN CAUSE HEADACHE, MENTAL CONFUSION, FATIGUE, LOSS OF APPETITE, NAUSEA, VOMITING, COUGH, LOSS OF SENSE OF BALANCE, AND VISUAL DISTURBANCES. PROLONG OR REPEATED SKIN CONTACT MAY CAUSE DERMATITIS.

IT IS CONCLUDED TO BE AN ANIMAL CARCINOGEN BASED ON LABORATORY STUDIES OF RATS AND MICE AT HIGH LEVELS OF EXPOSURE. THERE IS NO DATA SHOWING A RELATIONSHIP BETWEEN THESE STUDIES AND THE POTENTIAL AS A HUMAN CARCINOGEN.

EXCESSIVE EXPOSURE MAY CAUSE CENTRAL NERVOUS SYSTEM, LIVER AND KIDNEY EFFECTS.

FIRST AID:

EYE CONTACT - IMMEDIATELY FLUSH WITH LARGE AMOUNTS OF WATER FOR AT 15 MINUTES, HOLDING LIDS APART TO ENSURE FLUSHING OF THE ENTIRE EYE SURFACE.

SEEK MEDICAL ATTENTION IMMEDIATELY.

SKIN CONTACT - WASH CONTAMINATED AREA WITH SOAP AND WATER. A SOOTHING OINTMENT MAY BE APPLIED TO IRRITATED SKIN AFTER CLEANSING. REMOVE CONTAMINATED CLOTHING AND FOOTWEAR AND WASH CLOTHING BEFORE REUSE. DISCARD FOOTWEAR WHICH CANNOT BE DECONTAMINATED. SEEK MEDICAL ATTENTION.

INHALATION - GET PERSON OUT OF CONTAMINATED AREA TO FRESH AIR. IF BREATHING HAS STOPPED ARTIFICIAL RESPIRATION SHOULD BE STARTED. OXYGEN MAY BE ADMINISTERED, IF READILY AVAILABLE. SEEK MEDICAL ATTENTION IMMEDIATELY.

INGESTION - IF SWALLOWED DO NOT INDUCE VOMITING. IF VOMITING OCCURS SPONTANEOUSLY, POSITION INDIVIDUAL'S HEAD TO KEEP AIRWAY CLEAR. NEVER GIVE ANYTHING BY MOUTH TO AN UNCONCIOUS PERSON. SEEK MEDICAL ATTENTION.

SECTION 1 OF SYCAMORE

FOR COATINGS, RESINS AND RELATED MATERIALS

DATE OF PREP. 8/12/86

QUIK COLOR GLOSS RED

PAGE 1

SECTION 1

MANUFACTURER: SEYMOUR OF SYCAMORE, INC. 917 CROSBY AVE., SYCAMORE, IL. 60178
EMERGENCY TELEPHONE NO. 815-895-9101

TRADE NAME: QUIK COLOR GLOSS RED
PRODUCT CLASS: AEROSOL - VINYL TOLUENE ALKYD ENAMEL
MANUFACTURERS CODE IDENTIFICATION: 00-0011-0004

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SECTION 2 - HAZARDOUS INGREDIENTS

INGREDIENT - (CAS#)	PERCENT	ACGIH TLV(TWA)/OSHA PEL		LEL	VAPOR F AEROSOL 40 P.S. 8 70 I
		PPM	MG/M3		
TITANIUM DIOXIDE (13463-67-7) (AS DUST)	.13	ND	15.0	ND	
METHYLENE CHLORIDE (75-09-2)	36.81	100.0	350.0	13.00	
TOLUENE (108-88-3)	13.41	100.0	375.0	1.27	
MINERAL SPIRITS (64742-86-7)	.86	ND	ND	.70	
VARNISH MAKERS & PAINTER NAPHTHA (8030-30-6)	3.86	300.0	1,350.0	1.10	
PROPANE - (74-98-6)	21.0	ND	ND	2.30	
ISOBUTANE - (75-28-5)	14.0	ND	ND	1.90	

MATERIAL	8-HOUR TIME		ACCEPTABLE MAXIMUM PEAK ABOVE THE	
	WEIGHTED	ACCEPTABLE	CEILING	CONCENTRATION
	AVERAGE	CONCENTRATION	FOR AN 8-HOUR SHIFT	
METHYLENE CHLORIDE	500 PPM	1,000 PPM	2,000 PPM	5 MINUTES IN
TOLUENE	200 PPM	300 PPM	500 PPM	ANY 2 HOURS.
				10 MINUTUTES.

SECTION 3 - PHYSICAL DATA

BOILING POINT: NA VAPOR DENSITY: HEAVIER THAN AIR
EVAPORATION RATE: FASTER THAN ETHER. PERCENT VOLATILE WEIGHT PER
BY VOLUME: 85% GALLON: NA

SECTION 4 - FIRE AND EXPLOSION DATA

FLASH POINT: AEROSOL-10 DEG. F (T.O.C.) LEL: SEE SECTION 2
FLAMMABILITY CLASSIFICATION: NA
DOT: CONSUMER COMMODITY ORND
EXTINGUISHING MEDIA: USE CARBON DIOXIDE, DRY CHEMICAL OR FOAM.
UNUSUAL FIRE AND EXPOSION HAZARDS: EXPOSURE TO HEAT MAY CAUSE BURSTING OF AEROSOL CAN.

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Rev 2
8/86

DEPT. OF COATED PRODUCTS COMPANY
HDS NUMBER - 0000-00-0190
APPROVALS
SUPERVISOR
SALES
PURCHASER

IMMEDIATELY.

QUIK COLOR GLOSS REI

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TOLUENE (108-88-3)

ACUTE OVEREXPOSURE -

OVEREXPOSURE CAN LEAD TO CENTRAL NERVOUS SYSTEM DEPRESSION PRODUCING SUCH EFFECTS AS HEADACHE, DIZZINESS, NAUSEA, AND LOSS OF CONSCIOUSNESS.

EYE CONTACT - SHORT-TERM LIQUID OR VAPOR CONTACT MAY RESULT IN SLIGHT EYE IRRITATION. PROLONGED AND REPEATED CONTACT MAY BE MORE IRRITATING.

SKIN CONTACT - PROLONGED AND REPEATED LIQUID CONTACT CAN CAUSE DEFATTING AND DRYING OF THE SKIN WHICH MAY RESULT IN SKIN IRRITATION AND DERMATITIS.

INHALATION - HIGH CONCENTRATIONS OR PROLONGED TO LOWER CONCENTRATIONS MAY BE SLIGHTLY IRRITATING TO MUCOUS MEMBRANES.

INGESTION - LIQUID INGESTION MAY RESULT IN VOMITING; ASPIRATION (BREATHING) OF VOMITUS INTO THE LUNGS MUST BE AVOIDED AS EVEN SMALL QUANTITIES IN THE LUNGS MAY RESULT IN CHEMICAL PNEUMONITIS AND PULMONARY EDEMA/HEMORRHAGE.

CHRONIC OVEREXPOSURE - RESPIRATORY TRACT IRRITATION.

CENTRAL NERVOUS SYSTEM DEPRESSION IN HIGH CONCENTRATIONS.

LIVER AND KIDNEY DAMAGE.

BRAIN CELL DAMAGE MAY RESULT FROM LONG TERM INHALATION OF TOLUENE VAPOR.

ANIMAL STUDIES HAVE SHOWN THAT INHALATION OF HIGH LEVELS OF TOLUENE PRODUCED CARDIAC SENSITIZATION. SUCH SENSITIZATION MAY CAUSE FATAL CHANGES IN HEART RYTHMS. RATS EXPOSED TO 1400 PPM OR 1200 PPM OF TOLUENE FOR 14 HOURS PER DAY FOR 4 TO 5 WEEKS (RESPECTIVELY) EXHIBITED HIGH FREQUENCY HEARING DEFECTS. THERE IS NO EVIDENCE THAT INDUSTRIALLY ACCEPTED LEVELS OF TOLUENE VAPORS (E.G. THE TLV) HAVE PRODUCED CARDIAC EFFECTS IN HUMANS.

FIRST AID:

EYE CONTACT - FLUSH WITH WATER FOR 15 MINUTES WHILE HOLDING EYELIDS OPEN. GET MEDICAL ATTENTION.

SKIN CONTACT - FLUSH WITH WATER WHILE REMOVING CONTAMINATED CLOTHING AND SHOES. FOLLOW BY WASHING WITH SOAP AND WATER. DO NOT REUSE CLOTHING OR SHOES UNTIL CLEANED. IF IRRITATION PERSISTS, GET MEDICAL ATTENTION.

INHALATION - REMOVE VICTIM TO FRESH AIR AND PROVIDE OXYGEN IF BREATHING IS DIFFICULT. GIVE ARTIFICIAL RESPIRATION IF NOT BREATHING. GET MEDICAL ATTENTION.

INGESTION - DO NOT INDUCE VOMITING. IF VOMITING OCCURS SPONTANEOUSLY, KEEP HEAD BELOW HIPS TO PREVENT ASPIRATION OF LIQUID INTO THE LUNGS. GET MEDICAL ATTENTION.

MINERAL SPIRITS

(64742-86-7)

ACUTE OVEREXPOSURE - CAN LEAD TO CENTRAL NERVOUS SYSTEM DEPRESSION PRODUCING SUCH EFFECTS AS HEADACHE, DIZZINESS, NAUSEA, AND LOSS OF CONSCIOUSNESS.

EYE CONTACT - SHORT TERM LIQUID OR VAPOR CONTACT MAY RESULT IN SLIGHT EYE IRRITATION. PROLONGED AND REPEATED CONTACT MAY BE MORE IRRITATING.

SKIN CONTACT - PROLONGED AND REPEATED LIQUID CONTACT CAN CAUSE DEFATTING AND DRYING OF THE SKIN WHICH MAY RESULT IN SKIN IRRITATION AND DERMATITIS.

INHALATION - HIGH CONCENTRATIONS OR PROLONGED EXPOSURE TO LOWER CONCENTRATIONS MAY BE SLIGHTLY IRRITATING TO MUCOUS MEMBRANES.

INGESTION - LIQUID INGESTION MAY RESULT IN VOMITING; ASPIRATION (BREATHING IN) OF LIQUID MUST BE AVOIDED AS LIQUID CONTACT WITH THE LUNGS CAN RESULT IN CHEMICAL PNEUMONITIS AND PULMONARY EDEMA/HEMORRHAGE.

FIRST AID:

EYE CONTACT - FLUSH WITH WATER. IF PERSISTENT IRRITATION OCCURS, GET

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QUICK COLOR GLOSS

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RED

MEDICAL ATTENTION.

SKIN CONTACT - WASH WITH SOAP AND WATER. REMOVE CONTAMINATED CLOTHING AND DO NOT REUSE UNTIL LAUNDERED. IF PERSISTENT IRRITATION OCCURS, GET MEDICAL ATTENTION.

INHALATION - REMOVE TO FRESH AIR AND PROVIDE OXYGEN IF BREATHING IS DIFFICULT. GIVE ARTIFICIAL RESPIRATION IF NOT BREATHING. GET MEDICAL ATTENTION.

INGESTION - DO NOT INDUCE VOMITING EVEN THOUGH VOMITING MAY OCCUR. IF VOMITING OCCURS, KEEP HEAD BELOW HIPS TO PREVENT ASPIRATION OF LIQUID INTO THE LUNGS. GET MEDICAL ATTENTION.

VARNISH MAKERS & PAINTER

NAPHTHA (8030-30-6)

ACUTE OVEREXPOSURE - CENTRAL NERVOUS SYSTEM DEPRESSION IN HIGH CONCENTRATIONS.

EYE CONTACT - MAY BE AN EYE IRRITANT.

SKIN CONTACT - PROLONGED OR REPEATED CONTACT MAY CAUSE SKIN IRRITATION.

FIRST AID:

EYE CONTACT - FLUSH EYES WITH LARGE QUANTITIES OF WATER FOR AT LEAST 15 MINUTES AND SEEK IMMEDIATE MEDICAL ATTENTION.

SKIN CONTACT - WASH AFFECTED AREA WITH SOAP AND LARGE QUANTITIES OF WATER. WASH CONTAMINATED CLOTHING BEFORE REUSE.

INHALATION - IF BREATHING DIFFICULTIES, DIZZINESS, OR LIGHtheadEDNESS OCCUR WHEN WORKING IN AREAS WITH HIGH VAPOR CONCENTRATIONS, VICTIM SHOULD SEEK AIR FREE OF VAPORS. IF VICTIM EXPERIENCES CONTINUED BREATHING DIFFICULTIES, ADMINISTER OXYGEN UNTIL MEDICAL ASSISTANCE CAN BE RENDERED. IF BREATHING STOPS, BEGIN ARTIFICIAL RESPIRATION AND SEEK IMMEDIATE MEDICAL ATTENTION.

INGESTION - IF SWALLOWED, DO NOT INDUCE VOMITING. SEEK IMMEDIATE MEDICAL ADVICE AND/OR ATTENTION.

SECTION 6 - REACTIVITY DATA

STABILITY: STABLE CONDITIONS TO AVOID: DO NOT STORE ABOVE 120 DEG. F. KEEP FROM SPARKS, PILOT LIGHTS OR OPEN FLAME.

INCOMPATABILITY: (MATERIALS TO AVOID) NONE KNOWN

HAZARDOUS DECOMPOSITION PRODUCTS: MAY PRODUCE HAZARDOUS FUMES WHEN HEATED TO DECOMPOSITION. FUMES MAY CONTAIN CARBON DIOXIDE AND/OR CARBON MONOXIDE. FUMES MAY ALSO CONTAIN HYDROGEN CHLORIDE VAPOR AND TRACES OF PHOSGENE.

HAZARDOUS POLYMERIZATION: WILL NOT OCCUR.

CONDITIONS TO AVOID: NA

SECTION 7 - SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: REMOVE ALL SOURCES OF IGNITION, AVOID BREATHING VAPORS, VENTILATE AREA. WIPE UP WITH INERT MATERIALS AND PLACE IN APPROPRIATE CONTAINER.

WASTE DISPOSAL METHODS: DO NOT INCINERATE AEROSOL, DISPOSE OF IN ACCORDANCE WITH LOCAL, STATE AND FEDERAL REGULATIONS. DO NOT PLACE AEROSOL CANS IN HOME COMPACTOR. DO NOT PUNCTURE.

SECTION 8 - SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION: AVOID CONTINUOUS BREATHING OF VAPORS AND SPRAY MIST.
A SELF CONTAINED BREATHING APPARATUS REQUIRED FOR CONCENTRATIONS ABOVE
TLV LIMITS.

VENTILATION: USE WITH ADEQUATE VENTILATION, SUFFICIENT TO PREVENT
INHALATION OF SOLVENT VAPORS.

PROTECTIVE GLOVES: OPTIONAL

EYE PROTECTION: ONLY UNDER CONDITIONS WHERE SPRAY MIST MIGHT GET INTO EYES.

SECTION 9 - SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING: DO NOT STORE ABOVE 120 DEG. F.
EXPOSURE TO HEAT OR PROLONG EXPOSURE TO SUN MAY CAUSE BURSTING.

OTHER PRECAUTIONS: USE ONLY AS DIRECTED. INTENTIONAL MISUSE BY DELIBERATELY
CONCENTRATING VAPORS AND INHALING CONTENTS CAN BE HARMFUL OR FATAL.

QUICK
COLOR
GLASS RED

SECTION 1

DARK GREEN

MANUFACTURER: SEYMOUR OF SYCAMORE, INC. 917 CROSBY AVE., SYCAMORE, IL. 60178
EMERGENCY TELEPHONE NO. 815-895-9101

TRADE NAME: QUICK COLOR GLOSS DARK GREEN
PRODUCT CLASS: AEROSOL - VINYL TOLUENE ALKYL ENAMEL
MANUFACTURERS CODE IDENTIFICATION: 00-0011-0008

SECTION 2 - HAZARDOUS INGREDIENTS

INGREDIENT - (CAS#)	ACGIH TLV(TWA)/OSHA PEL			LEL	VAPOR PRESSURE AEROSOL CANS 40 P.S.I. @ 70 DEG. F
	PERCENT	PPM	MG/M3		
METHYLENE CHLORIDE (75-09-2)	36.02	100.0	350.0	13.00	
	PEL - SEE BOTTOM OF SECTION 2.				
TOLUENE (108-88-3)	14.10	100.0	375.0	1.27	
	PEL - SEE BOTTOM OF SECTION 2.				
MINERAL SPIRITS (64742-86-7)	.29	ND	ND	.70	
		ND	ND		
VARNISH MAKERS & PAINTER NAPHTHA (8030-30-6)	3.79	300.0	1,350.0	1.10	
		ND	ND		
XYLENE (1330-20-7)	.49	100.0	435.0	1.00	
		100	435		
PROPANE - (74-98-6)	21.0	ND	ND	2.30	
		1000.0	1800.0		
ISOBUTANE - (75-28-5)	14.0	ND	ND	1.90	

MATERIAL	8-HOUR TIME WEIGHTED AVERAGE	ACCEPTABLE CEILING CONCENTRATION	ACCEPTABLE MAXIMUM PEAK ABOVE THE ACCEPTANCE CEILING CONCENTRATION FOR AN 8-HOUR SHIFT	
			CONCENTRATION	MAXIMUM DURATION
METHYLENE CHLORIDE	500 PPM	1,000 PPM	2,000 PPM	5 MINUTES IN ANY 2 HOURS.
TOLUENE	200 PPM	300 PPM	500 PPM	10 MINUTES.

SECTION 3 - PHYSICAL DATA

BOILING POINT: NA VAPOR DENSITY: HEAVIER THAN AIR
EVAPORATION RATE: FASTER THAN ETHER. PERCENT VOLATILE WEIGHT PER
BY VOLUME: 85X GALLON: NA

SECTION 4 - FIRE AND EXPLOSION DATA

FLASH POINT: AEROSOL-10 DEG. F (T.O.C.) LEL: SEE SECTION 2
FLAMMABILITY CLASSIFICATION: NA
DOT: CONSUMER COMMODITY ORMD

EXTINGUISHING MEDIA: USE CARBON DIOXIDE, DRY CHEMICAL OR FOAM.

UNUSUAL FIRE AND EXPOSURE HAZARDS: EXPOSURE TO HEAT MAY CAUSE BURSTING OF AEROSOL
CAN.

D.14/5
Acid
8-86

#11-8

OSHA 309
HSDS NUMBER - 0000-00-0191
ENVIRONMENTAL PROTECTION
AGENCY

11-00 HUIK COLOR GLOSS DARK GREEN

SPECIAL FIRE FIGHTING PROCEDURES: WATER SPRAY MAY BE INEFFECTIVE. WATER MAY BE USED TO COOL CONTAINERS TO PREVENT BURSTING. IF WATER IS USED, FOG NOZZLES ARE PREFERABLE. WEAR GOGGLES AND SELF CONTAINED BREATHING APPARATUS.

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SECTION 5 - HEALTH HAZARD

THRESHOLD LIMIT VALUE: SEE SECTION 2

METHYLENE CHLORIDE (75-09-2)

ACUTE OVEREXPOSURE - INHALATION OF VAPORS CAN CAUSE HEADACHE, DIZZINESS AND STUPOR, NAUSEA, AND VOMITING. SEVERE OVEREXPOSURE MAY CAUSE MUSCULAR INCOORDINATION, UNCONCIOUSNESS, AND DEATH.

INHALATION - IRRITATES RESPIRATORY TRACT.

SKIN CONTACT - MILDLY IRRITATING TO SKIN. SKIN CONTACT MAY PRODUCE A BURNING SENSATION. PROLONGED OR REPEATED CONTACT MAY CAUSE SKIN TO BECOME RED, ROUGH AND DRY DUE TO THE REMOVAL OF NATURAL OILS AND MAY RESULT IN DERMATITIS.

SKIN ABSORPTION - RAPIDLY ABSORBED THROUGH THE SKIN.

EYE CONTACT - AN IRRITANT OF THE EYES CAUSING PAIN, AND GENERAL INFLAMMATION.

INGESTION - IT CAN IRRITATE THE GASTROINTESTINAL TRACT. IT COULD PRODUCE CHEMICAL PNEUMONIA IF VOMITING RESULTS IN ASPIRATION INTO THE LUNGS. IT MAY ULTIMATELY RESULT IN UNCONSCIOUSNESS AND EVEN DEATH.

CHRONIC OVEREXPOSURE - CAN CAUSE HEADACHE, MENTAL CONFUSION, FATIGUE, LOSS OF APPETITE, NAUSEA, VOMITING, COUGH, LOSS OF SENSE OF BALANCE, AND VISUAL DISTURBANCES. PROLONG OR REPEATED SKIN CONTACT MAY CAUSE DERMATITIS.

IT IS CONCLUDED TO BE AN ANIMAL CARCINOGEN BASED ON LABORATORY STUDIES OF RATS AND MICE AT HIGH LEVELS OF EXPOSURE. THERE IS NO DATA SHOWING A RELATIONSHIP BETWEEN THESE STUDIES AND THE POTENTIAL AS A HUMAN CARCINOGEN. EXCESSIVE EXPOSURE MAY CAUSE CENTRAL NERVOUS SYSTEM, LIVER AND KIDNEY EFFECTS.

FIRST AID:

EYE CONTACT - IMMEDIATELY FLUSH WITH LARGE AMOUNTS OF WATER FOR AT 15 MINUTES, HOLDING LIDS APART TO ENSURE FLUSHING OF THE ENTIRE EYE SURFACE. SEEK MEDICAL ATTENTION IMMEDIATELY.

SKIN CONTACT - WASH CONTAMINATED AREA WITH SOAP AND WATER. A SOOTHING OINTMENT MAY BE APPLIED TO IRRITATED SKIN AFTER CLEANSING. REMOVE CONTAMINATED CLOTHING AND FOOTWEAR AND WASH CLOTHING BEFORE REUSE. DISCARD FOOTWEAR WHICH CANNOT BE DECONTAMINATED. SEEK MEDICAL ATTENTION.

INHALATION - GET PERSON OUT OF CONTAMINATED AREA TO FRESH AIR. IF BREATHING HAS STOPPED ARTIFICIAL RESPIRATION SHOULD BE STARTED. OXYGEN MAY BE ADMINISTERED, IF READILY AVAILABLE. SEEK MEDICAL ATTENTION IMMEDIATELY.

INGESTION - IF SWALLOWED DO NOT INDUCE VOMITING. IF VOMITING OCCURS SPONTANEOUSLY, POSITION INDIVIDUAL'S HEAD TO KEEP AIRWAY CLEAR. NEVER GIVE ANYTHING BY MOUTH TO AN UNCONCIOUS PERSON. SEEK MEDICAL ATTENTION. IMMEDIATELY.

TOLUENE (108-88-3)

ACUTE OVEREXPOSURE -
OVEREXPOSURE CAN LEAD TO CENTRAL NERVOUS SYSTEM
DEPRESSION PRODUCING SUCH EFFECTS AS HEADACHE, DIZZINESS, NAUSEA, AND LOSS

WIKI LUKOR GLOSS DARK GREEN #11-E

OF CONSCIOUSNESS.

EYE CONTACT - SHORT-TERM LIQUID OR VAPOR CONTACT MAY RESULT IN SLIGHT EYE IRRITATION. PROLONGED AND REPEATED CONTACT MAY BE MORE IRRITATING.

SKIN CONTACT - PROLONGED AND REPEATED LIQUID CONTACT CAN CAUSE DEFATTING AND DRYING OF THE SKIN WHICH MAY RESULT IN SKIN IRRITATION AND DERMATITIS. INHALATION - HIGH CONCENTRATIONS OR PROLONGED TO LOWER CONCENTRATIONS MAY BE SLIGHTLY IRRITATING TO MUCOUS MEMBRANES.

INGESTION - LIQUID INGESTION MAY RESULT IN VOMITING; ASPIRATION (BREATHING) OF VOMITUS INTO THE LUNGS MUST BE AVOIDED AS EVEN SMALL QUANTITIES IN THE LUNGS MAY RESULT IN CHEMICAL PNEUMONITIS AND PULMONARY EDEMA/HEMORRHAGE.

CHRONIC OVEREXPOSURE - RESPIRATORY TRACT IRRITATION.

CENTRAL NERVOUS SYSTEM DEPRESSION IN HIGH CONCENTRATIONS.

LIVER AND KIDNEY DAMAGE.

BRAIN CELL DAMAGE MAY RESULT FROM LONG TERM INHALATION OF TOLUENE VAPOR.

ANIMAL STUDIES HAVE SHOWN THAT INHALATION OF HIGH LEVELS OF TOLUENE PRODUCED CARDIAC SENSITIZATION. SUCH SENSITIZATION MAY CAUSE FATAL CHANGES IN HEART RYTHMS. RATS EXPOSED TO 1400 PPM OR 1200 PPM OF TOLUENE FOR 14 HOURS PER DAY FOR 4 TO 5 WEEKS (RESPECTIVELY) EXHIBITED HIGH FREQUENCY HEARING DEFECTS. THERE IS NO EVIDENCE THAT INDUSTRIALLY ACCEPTED LEVELS OF TOLUENE VAPORS (E.G. THE TLV) HAVE PRODUCED CARDIAC EFFECTS IN HUMANS.

FIRST AID:

EYE CONTACT - FLUSH WITH WATER FOR 15 MINUTES WHILE HOLDING EYELIDS OPEN. GET MEDICAL ATTENTION.

SKIN CONTACT - FLUSH WITH WATER WHILE REMOVING CONTAMINATED CLOTHING AND SHOES. FOLLOW BY WASHING WITH SOAP AND WATER. DO NOT REUSE CLOTHING OR SHOES UNTIL CLEANED. IF IRRITATION PERSISTS, GET MEDICAL ATTENTION.

INHALATION - REMOVE VICTIM TO FRESH AIR AND PROVIDE OXYGEN IF BREATHING IS DIFFICULT. GIVE ARTIFICIAL RESPIRATION IF NOT BREATHING. GET MEDICAL ATTENTION.

INGESTION - DO NOT INDUCE VOMITING. IF VOMITING OCCURS SPONTANEOUSLY, KEEP HEAD BELOW HIPS TO PREVENT ASPIRATION OF LIQUID INTO THE LUNGS. GET MEDICAL ATTENTION.

MINERAL SPIRITS (64742-86-7)

ACUTE OVEREXPOSURE - CAN LEAD TO CENTRAL NERVOUS SYSTEM DEPRESSION PRODUCING SUCH EFFECTS AS HEADACHE, DIZZINESS, NAUSEA, AND LOSS OF CONSCIOUSNESS.

EYE CONTACT - SHORT TERM LIQUID OR VAPOR CONTACT MAY RESULT IN SLIGHT EYE IRRITATION. PROLONGED AND REPEATED CONTACT MAY BE MORE IRRITATING.

SKIN CONTACT - PROLONGED AND REPEATED LIQUID CONTACT CAN CAUSE DEFATTING AND DRYING OF THE SKIN WHICH MAY RESULT IN SKIN IRRITATION AND DERMATITIS.

INHALATION - HIGH CONCENTRATIONS OR PROLONGED EXPOSURE TO LOWER CONCENTRATIONS MAY BE SLIGHTLY IRRITATING TO MUCOUS MEMBRANES.

INGESTION - LIQUID INGESTION MAY RESULT IN VOMITING; ASPIRATION (BREATHING IN) OF LIQUID MUST BE AVOIDED AS LIQUID CONTACT WITH THE LUNGS CAN RESULT IN CHEMICAL PNEUMONITIS AND PULMONARY EDEMA/HEMORRHAGE.

FIRST AID:

EYE CONTACT - FLUSH WITH WATER. IF PERSISTENT IRRITATION OCCURS, GET MEDICAL ATTENTION.

SKIN CONTACT - WASH WITH SOAP AND WATER. REMOVE CONTAMINATED CLOTHING AND DO NOT REUSE UNTIL LAUNDERED. IF PERSISTENT IRRITATION OCCURS, GET MEDICAL ATTENTION.

INHALATION - REMOVE TO FRESH AIR AND PROVIDE OXYGEN IF BREATHING IS DIFFICULT. GIVE ARTIFICIAL RESPIRATION IF NOT BREATHING. GET MEDICAL ATTENTION.

#8
148

INGESTION - DO NOT INDUCE VOMITING EVEN THOUGH VOMITING MAY OCCUR. IF VOMITING OCCURS, KEEP HEAD BELOW HIPS TO PREVENT ASPIRATION OF LIQUID INTO THE LUNGS. GET MEDICAL ATTENTION.

7.4 of 5

THINK
COLOR
GLOSS
DARK
GREEN

VARNISH MAKERS & PAINTER

NAPHTHA (8030-30-6)

ACUTE OVEREXPOSURE - CENTRAL NERVOUS SYSTEM DEPRESSION IN HIGH CONCENTRATIONS.

EYE CONTACT - MAY BE AN EYE IRRITANT.

SKIN CONTACT - PROLONGED OR REPEATED CONTACT MAY CAUSE SKIN IRRITATION.

FIRST AID:

EYE CONTACT - FLUSH EYES WITH LARGE QUANTITIES OF WATER FOR AT LEAST 15 MINUTES AND SEEK IMMEDIATE MEDICAL ATTENTION.

SKIN CONTACT - WASH AFFECTED AREA WITH SOAP AND LARGE QUANTITIES OF WATER. WASH CONTAMINATED CLOTHING BEFORE REUSE.

INHALATION - IF BREATHING DIFFICULTIES, DIZZINESS, OR LIGHTEADEDNESS OCCUR WHEN WORKING IN AREAS WITH HIGH VAPOR CONCENTRATIONS, VICTIM SHOULD SEEK AIR FREE OF VAPORS. IF VICTIM EXPERIENCES CONTINUED BREATHING DIFFICULTIES, ADMINISTER OXYGEN UNTIL MEDICAL ASSISTANCE CAN BE RENDERED. IF BREATHING STOPS, BEGIN ARTIFICIAL RESPIRATION AND SEEK IMMEDIATE MEDICAL ATTENTION. INGESTION - IF SWALLOWED, DO NOT INDUCE VOMITING. SEEK IMMEDIATE MEDICAL ADVICE AND/OR ATTENTION.

XYLENE

(1330-20-7)

ACUTE OVEREXPOSURE -

EYE CONTACT - MAY BE AN EYE IRRITANT.

SKIN CONTACT - MAY CAUSE SKIN IRRITATION UPON PROLONGED OR REPEATED CONTACT.

INHALATION - IRRITANT TO UPPER RESPIRATORY SYSTEM. CAN CAUSE HEADACHE, NAUSEA, DIZZINESS.

INGESTION - MAY BE HARMFUL IF SWALLOWED.

OVEREXPOSURE -

POSSIBLE LIVER AND KIDNEY DAMAGE.

FIRST AID:

EYE CONTACT - FLUSH EYES WITH LARGE QUANTITIES OF WATER FOR AT LEAST 15 MINUTES AND SEEK IMMEDIATE MEDICAL ATTENTION.

SKIN CONTACT - WASH SKIN WITH SOAP AND LARGE QUANTITIES OF WATER AND SEEK MEDICAL ATTENTION IF IRRITATION FROM CONTACT PERSISTS.

INHALATION - IF BREATHING DIFFICULTIES, DIZZINESS, OR LIGHTEADEDNESS OCCUR WHEN WORKING IN AREAS WITH HIGH VAPOR CONCENTRATIONS, VICTIM SHOULD SEEK AIR FREE OF VAPORS. IF VICTIM EXPERIENCES CONTINUED BREATHING DIFFICULTIES, ADMINISTER OXYGEN UNTIL MEDICAL ASSISTANCE CAN BE RENDERED. IF BREATHING STOPS, BEGIN ARTIFICIAL RESPIRATION AND SEEK IMMEDIATE MEDICAL ATTENTION. INGESTION - IF SWALLOWED, DO NOT INDUCE VOMITING. SEEK IMMEDIATE MEDICAL ADVICE AND/OR ATTENTION.

SECTION 6 - REACTIVITY DATA

STABILITY: STABLE

CONDITIONS TO AVOID: DO NOT STORE ABOVE

120 DEG. F. KEEP FROM SPARKS, PILOT LIGHTS OR OPEN FLAME.

INCOMPATIBILITY: (MATERIALS TO AVOID) NONE KNOWN

HAZARDOUS DECOMPOSITION PRODUCTS: MAY PRODUCE HAZARDOUS FUMES WHEN HEATED

TO DECOMPOSITION. FUMES MAY CONTAIN CARBON DIOXIDE AND/OR CARBON MONOXIDE.
FUMES MAY ALSO CONTAIN HYDROGEN CHLORIDE VAPOR AND TRACES OF PHOSGENE.

HAZARDOUS POLYMERIZATION: WILL NOT OCCUR.

CONDITIONS TO AVOID: NA

SECTION 7 - SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: REMOVE ALL SOURCES OF IGNITION, AVOID BREATHING VAPORS, VENTILATE AREA. WIPE UP WITH INERT MATERIALS AND PLACE IN APPROPRIATE CONTAINER.

WASTE DISPOSAL METHODS: DO NOT INCINERATE AEROSOL, DISPOSE OF IN ACCORDANCE WITH LOCAL, STATE AND FEDERAL REGULATIONS. DO NOT PLACE AEROSOL CANS IN HOME COMPACTOR. DO NOT PUNCTURE.

SECTION 8 - SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION: AVOID CONTINUOUS BREATHING OF VAPORS AND SPRAY MIST. A SELF CONTAINED BREATHING APPARATUS REQUIRED FOR CONCENTRATIONS ABOVE TLV LIMITS.

VENTILATION: USE WITH ADEQUATE VENTILATION, SUFFICIENT TO PREVENT INHALATION OF SOLVENT VAPORS.

PROTECTIVE GLOVES: OPTIONAL

EYE PROTECTION: ONLY UNDER CONDITIONS WHERE SPRAY MIST MIGHT GET INTO EYES.

SECTION 9 - SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING: DO NOT STORE ABOVE 120 DEG. F. EXPOSURE TO HEAT OR PROLONG EXPOSURE TO SUN MAY CAUSE BURSTING.

OTHER PRECAUTIONS: USE ONLY AS DIRECTED. INTENTIONAL MISUSE BY DILIBERATELY CONCENTRATING VAPORS AND INHALING CONTENTS CAN BE HARMFUL OR FATAL.

7.545
FLUOR
COLOR
GLASS
DARK
GREEN

11-8

FOR COATINGS, RESINS AND RELATED MATERIALS
QUICK COLOR GLOSS YELLOW
 DATE OF PREP. 8/12/86

11-34
 File PAINT
 PAGE 1

SECTION 1

MANUFACTURER: SEYMOUR OF SYCAMORE, INC. 917 CROSBY AVE., SYCAMORE, IL. 60178
 EMERGENCY TELEPHONE NO. 815-895-9101

TRADE NAME: QUICK COLOR GLOSS YELLOW
 PRODUCT CLASS: AEROSOL - VINYL TOLUENE ALKYD ENAMEL
 MANUFACTURERS CODE IDENTIFICATION: 00-0011-0034

SECTION 2 - HAZARDOUS INGREDIENTS

INGREDIENT - (CAS#)	PERCENT	ACGIH TLV(TWA)/OSHA PEL		LEL	VAPOR PRESSU AEROSOL CAN 40 P.S.I. @ 70 DEG. F
		PPM	MG/M3		
TITANIUM DIOXIDE (13463-67-7) (AS DUST)	2.05	ND	15.0	ND	
METHYLENE CHLORIDE (75-09-2)	36.40	100.0	350.0	13.00	
PEL - SEE BOTTOM OF SECTION 2.					
TOLUENE (108-88-3)	12.86	100.0	375.0	1.27	
PEL - SEE BOTTOM OF SECTION 2.					
MINERAL SPIRITS (64742-86-7)	.11	ND	ND	.70	
VARNISH MAKERS & PAINTER NAPHTHA (8030-30-6)	3.89	300.0	1,350.0	1.10	
XYLENE (1330-20-7)	1.19	100.0	435.0	1.00	
PROPANE - (74-98-6)	21.0	ND	ND	2.30	
		1000.0	1800.0		
ISOBUTANE - (75-28-5)	14.0	ND	ND	1.90	

MATERIAL	8-HOUR TIME WEIGHTED AVERAGE	ACCEPTABLE CEILING CONCENTRATION	ACCEPTABLE MAXIMUM PEAK ABOVE THE ACCEPTANCE CEILING CONCENTRATION FOR AN 8-HOUR SHIFT	
			CONCENTRATION	MAXIMUM DURATION
METHYLENE CHLORIDE	500 PPM	1,000 PPM	2,000 PPM	5 MINUTES IN ANY 2 HOURS.
TOLUENE	200 PPM	300 PPM	500 PPM	10 MINUTES.

SECTION 3 - PHYSICAL DATA

BOILING POINT: NA VAPOR DENSITY: HEAVIER THAN AIR

EVAPORATION RATE: FASTER THAN ETHER. PERCENT VOLATILE WEIGHT PER
 BY VOLUME: 85X GALLON: NA

SECTION 4 - FIRE AND EXPLOSION DATA

FLASH POINT: AEROSOL-10 DEG. F (T.O.C.) LEL: SEE SECTION 2

FLAMMABILITY CLASSIFICATION: NA

DOT: CONSUMER COMMODITY ORMD

EXTINGUISHING MEDIA: USE CARBON DIOXIDE, DRY CHEMICAL OR FOAM.

QUICK COLOR GLOSS YELLOW
 MSDS NUMBER - 000011-0034
 CERRO COPPER
 ENVIRONMENTAL
 SAFETY DATA
 SHEET

195
 Rec'd
 8-86

#11-34 QUIK COLOR GLOSS YELLOW P.245

UNUSUAL FIRE AND EXPOSURE HAZARDS: EXPOSURE TO HEAT MAY CAUSE BURSTING OF AEROSOL CAN.

SPECIAL FIRE FIGHTING PROCEDURES: WATER SPRAY MAY BE INEFFECTIVE. WATER MAY BE USED TO COOL CONTAINERS TO PREVENT BURSTING. IF WATER IS USED, FOG NOZZLES ARE PREFERABLE. WEAR GOGGLES AND SELF CONTAINED BREATHING APPARATUS.

SECTION 5 - HEALTH HAZARD

THRESHOLD LIMIT VALUE: SEE SECTION 2

TITANIUM DIOXIDE (13463-67-7) (AS DUST)

OVEREXPOSURE - NONE KNOWN

NOTE: INHALATION TESTS IN RATS: DUST FROM DRIED PRODUCTS PRODUCED AN INERT OR NUISANCE DUST RESPONSE IN THE LUNGS.

METHYLENE CHLORIDE (75-09-2)

ACUTE OVEREXPOSURE - INHALATION OF VAPORS CAN CAUSE HEADACHE, DIZZINESS AND STUPOR, NAUSEA, AND VOMITING. SEVERE OVEREXPOSURE MAY CAUSE MUSCULAR INCOORDINATION, UNCONCIOUSNESS, AND DEATH.

INHALATION - IRRITATES RESPIRATORY TRACT.

SKIN CONTACT - MILDLY IRRITATING TO SKIN. SKIN CONTACT MAY PRODUCE A BURNING SENSATION. PROLONGED OR REPEATED CONTACT MAY CAUSE SKIN TO BECOME RED, ROUGH AND DRY DUE TO THE REMOVAL OF NATURAL OILS AND MAY RESULT IN DERMATITIS.

SKIN ABSORPTION - RAPIDLY ABSORBED THROUGH THE SKIN.

EYE CONTACT - AN IRRITANT OF THE EYES CAUSING PAIN, AND GENERAL INFLAMMATION.

INGESTION - IT CAN IRRITATE THE GASTROINTESTINAL TRACT. IT COULD PRODUCE CHEMICAL PNEUMONIA IF VOMITING RESULTS IN ASPIRATION INTO THE LUNGS. IT MAY ULTIMATELY RESULT IN UNCONSCIOUSNESS AND EVEN DEATH.

CHRONIC OVEREXPOSURE - CAN CAUSE HEADACHE, MENTAL CONFUSION, FATIGUE, LOSS OF APPETITE, NAUSEA, VOMITING, COUGH, LOSS OF SENSE OF BALANCE, AND VISUAL DISTURBANCES. PROLONG OR REPEATED SKIN CONTACT MAY CAUSE DERMATITIS.

IT IS CONCLUDED TO BE AN ANIMAL CARCINOGEN BASED ON LABORATORY STUDIES OF RATS AND MICE AT HIGH LEVELS OF EXPOSURE. THERE IS NO DATA SHOWING A RELATIONSHIP BETWEEN THESE STUDIES AND THE POTENTIAL AS A HUMAN CARCINOGEN. EXCESSIVE EXPOSURE MAY CAUSE CENTRAL NERVOUS SYSTEM, LIVER AND KIDNEY EFFECTS.

FIRST AID:

EYE CONTACT - IMMEDIATELY FLUSH WITH LARGE AMOUNTS OF WATER FOR AT 15 MINUTES, HOLDING LIDS APART TO ENSURE FLUSHING OF THE ENTIRE EYE SURFACE. SEEK MEDICAL ATTENTION IMMEDIATELY.

SKIN CONTACT - WASH CONTAMINATED AREA WITH SOAP AND WATER. A SOOTHING OINTMENT MAY BE APPLIED TO IRRITATED SKIN AFTER CLEANSING. REMOVE CONTAMINATED CLOTHING AND FOOTWEAR AND WASH CLOTHING BEFORE REUSE. DISCARD FOOTWEAR WHICH CANNOT BE DECONTAMINATED. SEEK MEDICAL ATTENTION.

INHALATION - GET PERSON OUT OF CONTAMINATED AREA TO FRESH AIR. IF BREATHING HAS STOPPED ARTIFICIAL RESPIRATION SHOULD BE STARTED. OXYGEN MAY BE ADMINISTERED, IF READILY AVAILABLE. SEEK MEDICAL ATTENTION IMMEDIATELY.

INGESTION - IF SWALLOWED DO NOT INDUCE VOMITING. IF VOMITING OCCURS SPONTANEOUSLY, POSITION INDIVIDUAL'S HEAD TO KEEP AIRWAY CLEAR. NEVER GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON. SEEK MEDICAL ATTENTION IMMEDIATELY.

QUICK
COLOR
GLOSS
YELLOW

TOLUENE

(108-88-3)

ACUTE OVEREXPOSURE -

OVEREXPOSURE CAN LEAD TO CENTRAL NERVOUS SYSTEM

DEPRESSION PRODUCING SUCH EFFECTS AS HEADACHE, DIZZINESS, NAUSEA, AND LOSS OF CONSCIOUSNESS.

EYE CONTACT - SHORT-TERM LIQUID OR VAPOR CONTACT MAY RESULT IN SLIGHT EYE IRRITATION. PROLONGED AND REPEATED CONTACT MAY BE MORE IRRITATING.

SKIN CONTACT - PROLONGED AND REPEATED LIQUID CONTACT CAN CAUSE DEFATTING AND DRYING OF THE SKIN WHICH MAY RESULT IN SKIN IRRITATION AND DERMATITIS.

INHALATION - HIGH CONCENTRATIONS OR PROLONGED TO LOWER CONCENTRATIONS MAY BE SLIGHTLY IRRITATING TO MUCOUS MEMBRANES.

INGESTION - LIQUID INGESTION MAY RESULT IN VOMITING; ASPIRATION (BREATHING) OF VOMITUS INTO THE LUNGS MUST BE AVOIDED AS EVEN SMALL QUANTITIES IN THE LUNGS MAY RESULT IN CHEMICAL PNEUMONITIS AND PULMONARY EDEMA/HEMORRHAGE.

CHRONIC OVEREXPOSURE - RESPIRATORY TRACT IRRITATION.

CENTRAL NERVOUS SYSTEM DEPRESSION IN HIGH CONCENTRATIONS.

LIVER AND KIDNEY DAMAGE.

BRAIN CELL DAMAGE MAY RESULT FROM LONG TERM INHALATION OF TOLUENE VAPOR.

ANIMAL STUDIES HAVE SHOWN THAT INHALATION OF HIGH LEVELS OF TOLUENE PRODUCED CARDIAC SENSITIZATION. SUCH SENSITIZATION MAY CAUSE FATAL CHANGES IN HEART RYTHMS. RATS EXPOSED TO 1400 PPM OR 1200 PPM OF TOLUENE FOR 14 HOURS PER DAY FOR 4 TO 5 WEEKS (RESPECTIVELY) EXHIBITED HIGH FREQUENCY HEARING DEFECTS. THERE IS NO EVIDENCE THAT INDUSTRIALLY ACCEPTED LEVELS OF TOLUENE VAPORS (E.G. THE TLV) HAVE PRODUCED CARDIAC EFFECTS IN HUMANS.

FIRST AID:

EYE CONTACT - FLUSH WITH WATER FOR 15 MINUTES WHILE HOLDING EYELIDS OPEN. GET MEDICAL ATTENTION.

SKIN CONTACT - FLUSH WITH WATER WHILE REMOVING CONTAMINATED CLOTHING AND SHOES. FOLLOW BY WASHING WITH SOAP AND WATER. DO NOT REUSE CLOTHING OR SHOES UNTIL CLEANED. IF IRRITATION PERSISTS, GET MEDICAL ATTENTION.

INHALATION - REMOVE VICTIM TO FRESH AIR AND PROVIDE OXYGEN IF BREATHING IS DIFFICULT. GIVE ARTIFICIAL RESPIRATION IF NOT BREATHING. GET MEDICAL ATTENTION.

INGESTION - DO NOT INDUCE VOMITING. IF VOMITING OCCURS SPONTANEOUSLY, KEEP HEAD BELOW HIPS TO PREVENT ASPIRATION OF LIQUID INTO THE LUNGS. GET MEDICAL ATTENTION.

MINERAL SPIRITS

(64742-86-7)

ACUTE OVEREXPOSURE - CAN LEAD TO CENTRAL NERVOUS SYSTEM DEPRESSION PRODUCING SUCH EFFECTS AS HEADACHE, DIZZINESS, NAUSEA, AND LOSS OF CONSCIOUSNESS.

EYE CONTACT - SHORT TERM LIQUID OR VAPOR CONTACT MAY RESULT IN SLIGHT EYE IRRITATION. PROLONGED AND REPEATED CONTACT MAY BE MORE IRRITATING.

SKIN CONTACT - PROLONGED AND REPEATED LIQUID CONTACT CAN CAUSE DEFATTING AND DRYING OF THE SKIN WHICH MAY RESULT IN SKIN IRRITATION AND DERMATITIS.

INHALATION - HIGH CONCENTRATIONS OR PROLONGED EXPOSURE TO LOWER CONCENTRATIONS MAY BE SLIGHTLY IRRITATING TO MUCOUS MEMBRANES.

INGESTION - LIQUID INGESTION MAY RESULT IN VOMITING; ASPIRATION (BREATHING IN) OF LIQUID MUST BE AVOIDED AS LIQUID CONTACT WITH THE LUNGS CAN RESULT IN CHEMICAL PNEUMONITIS AND PULMONARY EDEMA/HEMORRHAGE.

QUICK COLOR GLOSS YELLOW #11-3T P.445

FIRST AID:

EYE CONTACT - FLUSH WITH WATER. IF PERSISTENT IRRITATION OCCURS, GET MEDICAL ATTENTION.
SKIN CONTACT - WASH WITH SOAP AND WATER. REMOVE CONTAMINATED CLOTHING AND DO NOT REUSE UNTIL LAUNDERED. IF PERSISTENT IRRITATION OCCURS, GET MEDICAL ATTENTION.
INHALATION - REMOVE TO FRESH AIR AND PROVIDE OXYGEN IF BREATHING IS DIFFICULT. GIVE ARTIFICIAL RESPIRATION IF NOT BREATHING. GET MEDICAL ATTENTION.
INGESTION - DO NOT INDUCE VOMITING EVEN THOUGH VOMITING MAY OCCUR. IF VOMITING OCCURS, KEEP HEAD BELOW HIPS TO PREVENT ASPIRATION OF LIQUID INTO THE LUNGS. GET MEDICAL ATTENTION.

VARNISH MAKERS & PAINTER

NAPHTHA (8030-30-6)

ACUTE OVEREXPOSURE - CENTRAL NERVOUS SYSTEM DEPRESSION IN HIGH CONCENTRATIONS.
EYE CONTACT - MAY BE AN EYE IRRITANT.
SKIN CONTACT - PROLONGED OR REPEATED CONTACT MAY CAUSE SKIN IRRITATION.

FIRST AID:

EYE CONTACT - FLUSH EYES WITH LARGE QUANTITIES OF WATER FOR AT LEAST 15 MINUTES AND SEEK IMMEDIATE MEDICAL ATTENTION.
SKIN CONTACT - WASH AFFECTED AREA WITH SOAP AND LARGE QUANTITIES OF WATER. WASH CONTAMINATED CLOTHING BEFORE REUSE.
INHALATION - IF BREATHING DIFFICULTIES, DIZZINESS, OR LIGHTEADEDNESS OCCUR WHEN WORKING IN AREAS WITH HIGH VAPOR CONCENTRATIONS, VICTIM SHOULD SEEK AIR FREE OF VAPORS. IF VICTIM EXPERIENCES CONTINUED BREATHING DIFFICULTIES, ADMINISTER OXYGEN UNTIL MEDICAL ASSISTANCE CAN BE RENDERED. IF BREATHING STOPS, BEGIN ARTIFICIAL RESPIRATION AND SEEK IMMEDIATE MEDICAL ATTENTION.
INGESTION - IF SWALLOWED, DO NOT INDUCE VOMITING. SEEK IMMEDIATE MEDICAL ADVICE AND/OR ATTENTION.

XYLENE

(1330-20-7)

ACUTE OVEREXPOSURE -

EYE CONTACT - MAY BE AN EYE IRRITANT.
SKIN CONTACT - MAY CAUSE SKIN IRRITATION UPON PROLONGED OR REPEATED CONTACT.
INHALATION - IRRITANT TO UPPER RESPIRATORY SYSTEM. CAN CAUSE HEADACHE, NAUSEA, AND DIZZINESS.
INGESTION - MAY BE HARMFUL IF SWALLOWED.
CHRONIC OVEREXPOSURE -
POSSIBLE LIVER AND KIDNEY DAMAGE.

FIRST AID:

EYE CONTACT - FLUSH EYES WITH LARGE QUANTITIES OF WATER FOR AT LEAST 15 MINUTES AND SEEK IMMEDIATE MEDICAL ATTENTION.
SKIN CONTACT - WASH SKIN WITH SOAP AND LARGE QUANTITIES OF WATER AND SEEK MEDICAL ATTENTION IF IRRITATION FROM CONTACT PERSISTS.
INHALATION - IF BREATHING DIFFICULTIES, DIZZINESS, OR LIGHTEADEDNESS OCCUR WHEN WORKING IN AREAS WITH HIGH VAPOR CONCENTRATIONS, VICTIM SHOULD SEEK AIR FREE OF VAPORS. IF VICTIM EXPERIENCES CONTINUED BREATHING DIFFICULTIES, ADMINISTER OXYGEN UNTIL MEDICAL ASSISTANCE CAN BE RENDERED. IF BREATHING STOPS, BEGIN ARTIFICIAL RESPIRATION AND SEEK IMMEDIATE MEDICAL ATTENTION.
INGESTION - IF SWALLOWED, DO NOT INDUCE VOMITING. SEEK IMMEDIATE MEDICAL ADVICE AND/OR ATTENTION.

QUICK COLOR GLOSS YELLOW # 11-34

SECTION 6 - REACTIVITY DATA

STABILITY: STABLE CONDITIONS TO AVOID: DO NOT STORE ABOVE
120 DEG. F. KEEP FROM SPARKS, PILOT LIGHTS OR OPEN FLAME.

INCOMPATIBILITY: (MATERIALS TO AVOID) NONE KNOWN

HAZARDOUS DECOMPOSITION PRODUCTS: MAY PRODUCE HAZARDOUS FUMES WHEN HEATED
TO DECOMPOSITION. FUMES MAY CONTAIN CARBON DIOXIDE AND/OR CARBON MONOXIDE.
FUMES MAY ALSO CONTAIN HYDROGEN CHLORIDE VAPOR AND TRACES OF PHOSGENE.

HAZARDOUS POLYMERIZATION: WILL NOT OCCUR.

CONDITIONS TO AVOID: NA

SECTION 7 - SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: REMOVE ALL SOURCES OF
IGNITION, AVOID BREATHING VAPORS, VENTILATE AREA. WIPE UP WITH INERT MATERIALS
AND PLACE IN APPROPRIATE CONTAINER.

WASTE DISPOSAL METHODS: DO NOT INCINERATE AEROSOL, DISPOSE OF IN ACCORDANCE WITH
LOCAL, STATE AND FEDERAL REGULATIONS, DO NOT PLACE AEROSOL CANS IN HOME
COMPACTOR. DO NOT PUNCTURE.

SECTION 8 - SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION: AVOID CONTINUOUS BREATHING OF VAPORS AND SPRAY MIST.
A SELF CONTAINED BREATHING APPARATUS REQUIRED FOR CONCENTRATIONS ABOVE
TLV LIMITS.

VENTILATION: USE WITH ADEQUATE VENTILATION, SUFFICIENT TO PREVENT
INHALATION OF SOLVENT VAPORS.

PROTECTIVE GLOVES: OPTIONAL

EYE PROTECTION: ONLY UNDER CONDITIONS WHERE SPRAY MIST MIGHT GET INTO EYES.

SECTION 9 - SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING: DO NOT STORE ABOVE 120 DEG. F.
EXPOSURE TO HEAT OR PROLONG EXPOSURE TO SUN MAY CAUSE BURSTING.

OTHER PRECAUTIONS: USE ONLY AS DIRECTED. INTENTIONAL MISUSE BY DILIBERATELY
CONCENTRATING VAPORS AND INHALING CONTENTS CAN BE HARMFUL OR FATAL.

0.198

Rec'd
8/16

SEYMOUR OF SYCAMORE

MATERIAL SAFETY DATA SHEET
FOR COATINGS, RESINS AND RELATED MATERIALS

DATE OF PREP. 8/12/86

QUICK COLOR GLOSS BLUE

PAINT
PAGE 1

SECTION 1

MANUFACTURER: SEYMOUR OF SYCAMORE, INC. 917 CROSBY AVE., SYCAMORE, IL. 60178
EMERGENCY TELEPHONE NO. 815-895-9101

TRADE NAME: QUICK COLOR GLOSS BLUE
PRODUCT CLASS: AEROSOL - VINYL TOLUENE ALKYD ENAMEL
MANUFACTURERS CODE IDENTIFICATION: 00-0011-0035

#11-35

SECTION 2 - HAZARDOUS INGREDIENTS

INGREDIENT - (CAS#)	PERCENT	ACGIH TLV(TWA)/OSHA PEL		LEL	VAPOR PRESS: AEROSOL C/ 40 P.S.I. @ 70 DEG.
		PPM	MG/M3		
TITANIUM DIOXIDE (13463-67-7) (AS DUST)	1.55	ND	15.0	ND	
METHYLENE CHLORIDE (75-09-2)	37.33	100.0	350.0	13.00	
	PEL - SEE BOTTOM OF SECTION 2.				
TOLUENE (108-88-3)	13.50	100.0	375.0	1.27	
	PEL - SEE BOTTOM OF SECTION 2.				
MINERAL SPIRITS (64742-86-7)	.34	ND	ND	.70	
VARNISH MAKERS & PAINTER NAPHTHA (8030-30-6)	3.30	300.0	1,350.0	1.10	
		ND	ND		
XYLENE (1330-20-7)	.35	100.0	435.0	1.00	
		100	435		
PROPANE - (74-98-6)	21.0	ND	ND	2.30	
		1000.0	1800.0		
ISOBUTANE - (75-28-5)	14.0	ND	ND	1.90	

MATERIAL	8-HOUR TIME WEIGHTED AVERAGE	ACCEPTABLE CEILING CONCENTRATION	ACCEPTABLE MAXIMUM PEAK ABOVE THE ACCEPTANCE CEILING CONCENTRATION FOR AN 8-HOUR SHIFT	
			CONCENTRATION	MAXIMUM DURATION
METHYLENE CHLORIDE	500 PPM	1,000 PPM	2,000 PPM	5 MINUTES IN ANY 2 HOURS.
TOLUENE	200 PPM	300 PPM	500 PPM	10 MINUTES.

SECTION 3 - PHYSICAL DATA

BOILING POINT: NA VAPOR DENSITY: HEAVIER THAN AIR
EVAPORATION RATE: FASTER THAN ETHER. PERCENT VOLATILE BY VOLUME: 85X WEIGHT PER GALLON: NA

SECTION 4 - FIRE AND EXPLOSION DATA

FLASH POINT: AEROSOL-10 DEG. F (T.O.C.) LEL: SEE SECTION 2
FLAMMABILITY CLASSIFICATION: NA
DOT: CONSUMER COMMODITY ORMD
EXTINGUISHING MEDIA: USE CARBON DIOXIDE, DRY CHEMICAL OR FOAM.

CERRO CORP. PRODUCTS COMPANY
MSDS NUMBER - CCPC-00-0175

APPROVALS:

EDUCATIONAL: _____

SAFETY: _____

REGISTRATION: _____

11-35

QUICK COLOR GLOSS BLUE

UNUSUAL FIRE AND EXPOSURE HAZARDS: EXPOSURE TO HEAT MAY CAUSE BURSTING OF AEROSOL CAN.

P. 2945
11/1

SPECIAL FIRE FIGHTING PROCEDURES: WATER SPRAY MAY BE INEFFECTIVE. WATER MAY BE USED TO COOL CONTAINERS TO PREVENT BURSTING. IF WATER IS USED, FOG NOZZLES ARE PREFERABLE. WEAR GOGGLES AND SELF CONTAINED BREATHING APPARATUS.

SECTION 5 - HEALTH HAZARD

THRESHOLD LIMIT VALUE: SEE SECTION 2

TITANIUM DIOXIDE
(13463-67-7) (AS DUST)

OVEREXPOSURE - NONE KNOWN

NOTE: INHALATION TESTS IN RATS: DUST FROM DRIED PRODUCTS PRODUCED AN INERT OR NUISANCE DUST RESPONSE IN THE LUNGS.

METHYLENE CHLORIDE
(75-09-2)

ACUTE OVEREXPOSURE - INHALATION OF VAPORS CAN CAUSE HEADACHE, DIZZINESS AND STUPOR, NAUSEA, AND VOMITING. SEVERE OVEREXPOSURE MAY CAUSE MUSCULAR INCOORDINATION, UNCONCIOUSNESS, AND DEATH.

INHALATION - IRRITATES RESPIRATORY TRACT.

SKIN CONTACT - MILDLY IRRITATING TO SKIN. SKIN CONTACT MAY PRODUCE A BURNING SENSATION. PROLONGED OR REPEATED CONTACT MAY CAUSE SKIN TO BECOME RED, ROUGH AND DRY DUE TO THE REMOVAL OF NATURAL OILS AND MAY RESULT IN DERMATITIS.

SKIN ABSORPTION - RAPIDLY ABSORBED THROUGH THE SKIN.

EYE CONTACT - AN IRRITANT OF THE EYES CAUSING PAIN, AND GENERAL INFLAMMATION.

INGESTION - IT CAN IRRITATE THE GASTROINTESTINAL TRACT. IT COULD PRODUCE CHEMICAL PNEUMONIA IF VOMITING RESULTS IN ASPIRATION INTO THE LUNGS. IT MAY ULTIMATELY RESULT IN UNCONSCIOUSNESS AND EVEN DEATH.

CHRONIC OVEREXPOSURE - CAN CAUSE HEADACHE, MENTAL CONFUSION, FATIGUE, LOSS OF APPETITE, NAUSEA, VOMITING, COUGH, LOSS OF SENSE OF BALANCE, AND VISUAL DISTURBANCES. PROLONG OR REPEATED SKIN CONTACT MAY CAUSE DERMATITIS.

IT IS CONCLUDED TO BE AN ANIMAL CARCINOGEN BASED ON LABORATORY STUDIES OF RATS AND MICE AT HIGH LEVELS OF EXPOSURE. THERE IS NO DATA SHOWING A RELATIONSHIP BETWEEN THESE STUDIES AND THE POTENTIAL AS A HUMAN CARCINOGEN. EXCESSIVE EXPOSURE MAY CAUSE CENTRAL NERVOUS SYSTEM, LIVER AND KIDNEY EFFECTS.

FIRST AID:

EYE CONTACT - IMMEDIATELY FLUSH WITH LARGE AMOUNTS OF WATER FOR AT 15 MINUTES, HOLDING LIDS APART TO ENSURE FLUSHING OF THE ENTIRE EYE SURFACE, SEEK MEDICAL ATTENTION IMMEDIATELY.

SKIN CONTACT - WASH CONTAMINATED AREA WITH SOAP AND WATER. A SOOTHING OINTMENT MAY BE APPLIED TO IRRITATED SKIN AFTER CLEANSING. REMOVE CONTAMINATED CLOTHING AND FOOTWEAR AND WASH CLOTHING BEFORE REUSE. DISCARD FOOTWEAR WHICH CANNOT BE DECONTAMINATED. SEEK MEDICAL ATTENTION.

INHALATION - GET PERSON OUT OF CONTAMINATED AREA TO FRESH AIR. IF BREATHING HAS STOPPED ARTIFICIAL RESPIRATION SHOULD BE STARTED. OXYGEN MAY BE ADMINISTERED, IF READILY AVAILABLE. SEEK MEDICAL ATTENTION IMMEDIATELY.

2 P.385

#1135

ALIK
COLOR
GLOSS
BLUE

INGESTION - IF SWALLOWED DO NOT INDUCE VOMITING. IF VOMITING OCCURS SPONTANEOUSLY, POSITION INDIVIDUAL'S HEAD TO KEEP AIRWAY CLEAR. NEVER GIVE ANYTHING BY MOUTH TO AN UNCONCIOUS PERSON. SEEK MEDICAL ATTENTION. IMMEDIATELY.

TOLUENE (108-88-3)

ACUTE OVEREXPOSURE -

OVEREXPOSURE CAN LEAD TO CENTRAL NERVOUS SYSTEM DEPRESSION PRODUCING SUCH EFFECTS AS HEADACHE, DIZZINESS, NAUSEA, AND LOSS OF CONSCIOUSNESS.

EYE CONTACT - SHORT-TERM LIQUID OR VAPOR CONTACT MAY RESULT IN SLIGHT EYE IRRITATION. PROLONGED AND REPEATED CONTACT MAY BE MORE IRRITATING.

SKIN CONTACT - PROLONGED AND REPEATED LIQUID CONTACT CAN CAUSE DEFATTING AND DRYING OF THE SKIN WHICH MAY RESULT IN SKIN IRRITATION AND DERMATITIS.

INHALATION - HIGH CONCENTRATIONS OR PROLONGED TO LOWER CONCENTRATIONS MAY BE SLIGHTLY IRRITATING TO MUCOUS MEMBRANES.

INGESTION - LIQUID INGESTION MAY RESULT IN VOMITING; ASPIRATION (BREATHING) OF VOMITUS INTO THE LUNGS MUST BE AVOIDED AS EVEN SMALL

QUANTITIES IN THE LUNGS MAY RESULT IN CHEMICAL PNEUMONITIS AND PULMONARY EDEMA/HEMORRHAGE.

CHRONIC OVEREXPOSURE - RESPIRATORY TRACT IRRITATION.

CENTRAL NERVOUS SYSTEM DEPRESSION IN HIGH CONCENTRATIONS.

LIVER AND KIDNEY DAMAGE.

BRAIN CELL DAMAGE MAY RESULT FROM LONG TERM INHALATION OF TOLUENE VAPOR.

ANIMAL STUDIES HAVE SHOWN THAT INHALATION OF HIGH LEVELS OF TOLUENE PRODUCED CARDIAC SENSITIZATION. SUCH SENSITIZATION MAY CAUSE FATAL CHANGES IN HEART RHYTHMS. RATS EXPOSED TO 1400 PPM OR 1200 PPM OF TOLUENE FOR 14 HOURS PER

DAY FOR 4 TO 5 WEEKS (RESPECTIVELY) EXHIBITED HIGH FREQUENCY HEARING DEFECTS. THERE IS NO EVIDENCE THAT INDUSTRIALLY ACCEPTED LEVELS OF TOLUENE

VAPORS (E.G. THE TLV) HAVE PRODUCED CARDIAC EFFECTS IN HUMANS.

FIRST AID:

EYE CONTACT - FLUSH WITH WATER FOR 15 MINUTES WHILE HOLDING EYELIDS OPEN, GET MEDICAL ATTENTION.

SKIN CONTACT - FLUSH WITH WATER WHILE REMOVING CONTAMINATED CLOTHING AND SHOES. FOLLOW BY WASHING WITH SOAP AND WATER. DO NOT REUSE CLOTHING OR SHOES UNTIL CLEANED. IF IRRITATION PERSISTS, GET MEDICAL ATTENTION.

INHALATION - REMOVE VICTIM TO FRESH AIR AND PROVIDE OXYGEN IF BREATHING IS DIFFICULT. GIVE ARTIFICIAL RESPIRATION IF NOT BREATHING. GET MEDICAL ATTENTION.

INGESTION - DO NOT INDUCE VOMITING. IF VOMITING OCCURS SPONTANEOUSLY, KEEP HEAD BELOW HIPS TO PREVENT ASPIRATION OF LIQUID INTO THE LUNGS. GET MEDICAL ATTENTION.

MINERAL SPIRITS

(64742-86-7)

ACUTE OVEREXPOSURE - CAN LEAD TO CENTRAL NERVOUS SYSTEM DEPRESSION PRODUCING SUCH EFFECTS AS HEADACHE, DIZZINESS, NAUSEA, AND LOSS OF CONSCIOUSNESS.

EYE CONTACT - SHORT TERM LIQUID OR VAPOR CONTACT MAY RESULT IN SLIGHT EYE IRRITATION. PROLONGED AND REPEATED CONTACT MAY BE MORE IRRITATING.

SKIN CONTACT - PROLONGED AND REPEATED LIQUID CONTACT CAN CAUSE DEFATTING AND DRYING OF THE SKIN WHICH MAY RESULT IN SKIN IRRITATION AND DERMATITIS.

INHALATION - HIGH CONCENTRATIONS OR PROLONGED EXPOSURE TO LOWER CONCENTRATIONS MAY BE SLIGHTLY IRRITATING TO MUCOUS MEMBRANES.

INGESTION - LIQUID INGESTION MAY RESULT IN VOMITING; ASPIRATION (BREATHING IN) OF LIQUID MUST BE AVOIDED AS LIQUID CONTACT WITH THE LUNGS CAN RESULT IN CHEMICAL PNEUMONITIS AND PULMONARY EDEMA/HEMORRHAGE.

" #11-35

FIRST AID:

P. 475

ANIK
COLOR
GLASS
BLUE

EYE CONTACT - FLUSH WITH WATER. IF PERSISTENT IRRITATION OCCURS, GET MEDICAL ATTENTION.

SKIN CONTACT - WASH WITH SOAP AND WATER. REMOVE CONTAMINATED CLOTHING AND DO NOT REUSE UNTIL LAUNDERED. IF PERSISTENT IRRITATION OCCURS, GET MEDICAL ATTENTION.

INHALATION - REMOVE TO FRESH AIR AND PROVIDE OXYGEN IF BREATHING IS DIFFICULT. GIVE ARTIFICIAL RESPIRATION IF NOT BREATHING. GET MEDICAL ATTENTION.

INGESTION - DO NOT INDUCE VOMITING EVEN THOUGH VOMITING MAY OCCUR. IF VOMITING OCCURS, KEEP HEAD BELOW HIPS TO PREVENT ASPIRATION OF LIQUID INTO THE LUNGS. GET MEDICAL ATTENTION.

VARNISH MAKERS & PAINTER

NAPHTHA (8030-30-6)

ACUTE OVEREXPOSURE - CENTRAL NERVOUS SYSTEM DEPRESSION IN HIGH CONCENTRATIONS.

EYE CONTACT - MAY BE AN EYE IRRITANT.

SKIN CONTACT - PROLONGED OR REPEATED CONTACT MAY CAUSE SKIN IRRITATION.

FIRST AID:

EYE CONTACT - FLUSH EYES WITH LARGE QUANTITIES OF WATER FOR AT LEAST 15 MINUTES AND SEEK IMMEDIATE MEDICAL ATTENTION.

SKIN CONTACT - WASH AFFECTED AREA WITH SOAP AND LARGE QUANTITIES OF WATER. WASH CONTAMINATED CLOTHING BEFORE REUSE.

INHALATION - IF BREATHING DIFFICULTIES, DIZZINESS, OR LIGHTEADEDNESS OCCUR WHEN WORKING IN AREAS WITH HIGH VAPOR CONCENTRATIONS, VICTIM SHOULD SEEK

AIR FREE OF VAPORS. IF VICTIM EXPERIENCES CONTINUED BREATHING DIFFICULTIES, ADMINISTER OXYGEN UNTIL MEDICAL ASSISTANCE CAN BE RENDERED. IF BREATHING STOPS, BEGIN ARTIFICIAL RESPIRATION AND SEEK IMMEDIATE MEDICAL ATTENTION.

INGESTION - IF SWALLOWED, DO NOT INDUCE VOMITING. SEEK IMMEDIATE MEDICAL ADVICE AND/OR ATTENTION.

XYLENE

(1330-20-7)

ACUTE OVEREXPOSURE -

EYE CONTACT - MAY BE AN EYE IRRITANT.

SKIN CONTACT - MAY CAUSE SKIN IRRITATION UPON PROLONGED OR REPEATED CONTACT.

INHALATION - IRRITANT TO UPPER RESPIRATORY SYSTEM. CAN CAUSE HEADACHE, NAUSEA, AND DIZZINESS.

INGESTION - MAY BE HARMFUL IF SWALLOWED.

CHRONIC OVEREXPOSURE -

POSSIBLE LIVER AND KIDNEY DAMAGE.

FIRST AID:

EYE CONTACT - FLUSH EYES WITH LARGE QUANTITIES OF WATER FOR AT LEAST 15 MINUTES AND SEEK IMMEDIATE MEDICAL ATTENTION.

SKIN CONTACT - WASH SKIN WITH SOAP AND LARGE QUANTITIES OF WATER AND SEEK MEDICAL ATTENTION IF IRRITATION FROM CONTACT PERSISTS.

INHALATION - IF BREATHING DIFFICULTIES, DIZZINESS, OR LIGHTEADEDNESS OCCUR WHEN WORKING IN AREAS WITH HIGH VAPOR CONCENTRATIONS, VICTIM SHOULD SEEK

AIR FREE OF VAPORS. IF VICTIM EXPERIENCES CONTINUED BREATHING DIFFICULTIES, ADMINISTER OXYGEN UNTIL MEDICAL ASSISTANCE CAN BE RENDERED. IF BREATHING

STOPS, BEGIN ARTIFICIAL RESPIRATION AND SEEK IMMEDIATE MEDICAL ATTENTION.

INGESTION - IF SWALLOWED, DO NOT INDUCE VOMITING. SEEK IMMEDIATE MEDICAL ADVICE AND/OR ATTENTION.

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QUICK COLOR
GLASS BLUE

11-35

SECTION 6 - REACTIVITY DATA

STABILITY: STABLE CONDITIONS TO AVOID: DO NOT STORE ABOVE
120 DEG. F. KEEP FROM SPARKS, PILOT LIGHTS OR OPEN FLAME.

INCOMPATIBILITY: (MATERIALS TO AVOID) NONE KNOWN

HAZARDOUS DECOMPOSITION PRODUCTS: MAY PRODUCE HAZARDOUS FUMES WHEN HEATED
TO DECOMPOSITION. FUMES MAY CONTAIN CARBON DIOXIDE AND/OR CARBON MONOXIDE.
FUMES MAY ALSO CONTAIN HYDROGEN CHLORIDE VAPOR AND TRACES OF PHOSGENE.

HAZARDOUS POLYMERIZATION: WILL NOT OCCUR.

CONDITIONS TO AVOID: NA

SECTION 7 - SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: REMOVE ALL SOURCES OF
IGNITION, AVOID BREATHING VAPORS, VENTILATE AREA. WIPE UP WITH INERT MATERIALS
AND PLACE IN APPROPRIATE CONTAINER.

WASTE DISPOSAL METHODS: DO NOT INCINERATE AEROSOL, DISPOSE OF IN ACCORDANCE WITH
LOCAL, STATE AND FEDERAL REGULATIONS. DO NOT PLACE AEROSOL CANS IN HOME
COMPACTOR. DO NOT PUNCTURE.

SECTION 8 - SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION: AVOID CONTINUOUS BREATHING OF VAPORS AND SPRAY MIST.
A SELF CONTAINED BREATHING APPARATUS REQUIRED FOR CONCENTRATIONS ABOVE
TLV LIMITS.

VENTILATION: USE WITH ADEQUATE VENTILATION, SUFFICIENT TO PREVENT
INHALATION OF SOLVENT VAPORS.

PROTECTIVE GLOVES: OPTIONAL

EYE PROTECTION: ONLY UNDER CONDITIONS WHERE SPRAY MIST MIGHT GET INTO EYES.

SECTION 9 - SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING: DO NOT STORE ABOVE 120 DEG. F.
EXPOSURE TO HEAT OR PROLONG EXPOSURE TO SUN MAY CAUSE BURSTING.

OTHER PRECAUTIONS: USE ONLY AS DIRECTED, INTENTIONAL MISUSE BY DELIBERATELY
CONCENTRATING VAPORS AND INHALING CONTENTS CAN BE HARMFUL OR FATAL.

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BYCAMORE

FOR COATINGS, RESINS AND RELATED MATERIALS

DATE OF PREP. 8/12/86

SPRUCE GLOSS
ORANGE

PAGE 1

SECTION 1

MANUFACTURER: SEYMOUR OF BYCAMORE, INC. 917 CROSBY AVE., SYCAMORE, IL. 60178
EMERGENCY TELEPHONE NO. 815-895-9101

TRADE NAME: SPRUCE GLOSS ORANGE

PRODUCT CLASS: AEROSOL - VINYL TOLUENE ALKYD ENAMEL

MANUFACTURERS CODE IDENTIFICATION: 00-0098-0028

SECTION 2 - HAZARDOUS INGREDIENTS

INGREDIENT - (CAS#)	PERCENT	ACGIH TLV(TWA)/OSHA PEL		LEL	VAPOR PRESSURE AEROSOL CAN 40 P.S.I. @ 70 DEG. F
		PPM	MG/M3		
TITANIUM DIOXIDE (13463-67-7) (AS DUST)	1.61	ND	15.0	ND	
TOLUENE (108-88-3)	13.23	100.0	375.0	1.27	
ACETONE (67-64-1)	9.90	750.0	1,780.0	2.60	
MINERAL SPIRITS (64742-86-7)	.42	ND	ND	.70	
VARNISH MAKERS & PAINTER NAPHTHA (8030-30-6)	5.81	300.0	1,350.0	1.10	
XYLENE (1330-20-7)	2.86	100.0	435.0	1.00	
HEXANE (110-54-3)	18.06	50.0	180.0	1.20	
PROPANE - (74-98-6)	19.7	ND	ND	2.30	
ISOBUTANE - (75-28-5)	13.2	ND	ND	1.90	

MATERIAL	8-HOUR TIME WEIGHTED AVERAGE	ACCEPTABLE CEILING CONCENTRATION	ACCEPTABLE MAXIMUM PEAK ABOVE THE ACCEPTANCE CEILING CONCENTRATION FOR AN 8-HOUR SHIFT CONCENTRATION MAXIMUM DURATION	
			200 PPM	300 PPM
TOLUENE			500 PPM	10 MINUTES.

SECTION 3 - PHYSICAL DATA

BOILING POINT: NA

VAPOR DENSITY: HEAVIER THAN AIR

EVAPORATION RATE: FASTER THAN ETHER.

PERCENT VOLATILE
BY VOLUME: 85%WEIGHT PER
GALLON: NA

SECTION 4 - FIRE AND EXPLOSION DATA

FLASH POINT: AEROSOL-10 DEG. F (T.O.C.)

LEL: SEE SECTION 2

FLAMMABILITY CLASSIFICATION: NA

DOT: CONSUMER COMMODITY ORMD

EXTINGUISHING MEDIA: USE CARBON DIOXIDE, DRY CHEMICAL OR FOAM.

CERRO COPPER PRODUCTS COMPANY
HSDS NUMBER: CCPC-00-00194

ENVIRONMENTAL: (PRIORITY)
SAFETY: (PRIORITY)
HEALTH: (PRIORITY)

Rev'd
8/86

UNUSUAL FIRE AND EXPOSITION HAZARDS: EXPOSURE TO HEAT MAY CAUSE BURSTING OF AEROSOL CAN.

SPECIAL FIRE FIGHTING PROCEDURES: WATER SPRAY MAY BE INEFFECTIVE. WATER MAY BE USED TO COOL CONTAINERS TO PREVENT BURSTING. IF WATER IS USED, FOG NOZZLES ARE PREFERRED. WEAR GOGGLES AND SELF CONTAINED BREATHING APPARATUS.

SECTION 5 - HEALTH HAZARD

THRESHOLD LIMIT VALUE: SEE SECTION 2

TITANIUM DIOXIDE (13463-67-7) (AS DUST)

OVEREXPOSURE - NONE KNOWN

NOTE: INHALATION TESTS IN RATS: DUST FROM DRIED PRODUCTS PRODUCED AN INERT OR MILD DUST RESPONSE IN THE LUNGS.

TOLUENE

(108-88-3)

ACUTE OVEREXPOSURE -

OVEREXPOSURE CAN LEAD TO CENTRAL NERVOUS SYSTEM

DEPRESSION PRODUCING SUCH EFFECTS AS HEADACHE, DIZZINESS, NAUSEA, AND LOSS OF CONSCIOUSNESS.

EYE CONTACT - SHORT-TERM LIQUID OR VAPOR CONTACT MAY RESULT IN SLIGHT EYE IRRITATION. PROLONGED AND REPEATED CONTACT MAY BE MORE IRRITATING.

SKIN CONTACT - PROLONGED AND REPEATED LIQUID CONTACT CAN CAUSE DEFATTING AND DRYING OF THE SKIN WHICH MAY RESULT IN SKIN IRRITATION AND DERMATITIS.

INHALATION - HIGH CONCENTRATIONS OR PROLONGED TO LOWER CONCENTRATIONS MAY BE SLIGHTLY IRRITATING TO MUCOUS MEMBRANES.

INGESTION - LIQUID INGESTION MAY RESULT IN VOMITING; ASPIRATION

(BREATHING) OF VOMITUS INTO THE LUNGS MUST BE AVOIDED AS EVEN SMALL QUANTITIES IN THE LUNGS MAY RESULT IN CHEMICAL PNEUMONITIS AND PULMONARY EDEMA/HEMORRHAGE.

CHRONIC OVEREXPOSURE - RESPIRATORY TRACT IRRITATION.

CENTRAL NERVOUS SYSTEM DEPRESSION IN HIGH CONCENTRATIONS.

LIVER AND KIDNEY DAMAGE.

BRAIN CELL DAMAGE MAY RESULT FROM LONG TERM INHALATION OF TOLUENE VAPOR.

ANIMAL STUDIES HAVE SHOWN THAT INHALATION OF HIGH LEVELS OF TOLUENE PRODUCED CARDIAC SENSITIZATION. SUCH SENSITIZATION MAY CAUSE FATAL CHANGES IN HEART

RYTHMS. RATS EXPOSED TO 1400 PPM OR 1200 PPM OF TOLUENE FOR 14 HOURS PER DAY FOR 4 TO 5 WEEKS (RESPECTIVELY) EXHIBITED HIGH FREQUENCY HEARING DEFECTS. THERE IS NO EVIDENCE THAT INDUSTRIALLY ACCEPTED LEVELS OF TOLUENE VAPORS (E.G. THE TLV) HAVE PRODUCED CARDIAC EFFECTS IN HUMANS.

FIRST AID:

EYE CONTACT - FLUSH WITH WATER FOR 15 MINUTES WHILE HOLDING EYELIDS OPEN. GET MEDICAL ATTENTION.

SKIN CONTACT - FLUSH WITH WATER WHILE REMOVING CONTAMINATED CLOTHING AND SHOES. FOLLOW BY WASHING WITH SOAP AND WATER. DO NOT REUSE CLOTHING OR SHOES UNTIL CLEANED. IF IRRITATION PERSISTS, GET MEDICAL ATTENTION.

INHALATION - REMOVE VICTIM TO FRESH AIR AND PROVIDE OXYGEN IF BREATHING IS DIFFICULT. GIVE ARTIFICIAL RESPIRATION IF NOT BREATHING. GET MEDICAL ATTENTION.

INGESTION - DO NOT INDUCE VOMITING. IF VOMITING OCCURS SPONTANEOUSLY, KEEP

HEAD BELOW HIPS TO PREVENT ASPIRATION OF LIQUID INTO THE LUNGS. GET MEDICAL ATTENTION.

ACETONE

(67-64-1)

ACUTE OVEREXPOSURE -

EYE CONTACT - CAN CAUSE SEVERE IRRITATION, REDNESS, TEARING, BLURRED VISION.

SKIN CONTACT - PROLONG OR REPEATED CONTACT CAN CAUSE MODERATE IRRITATION, DEFATTING, DERMATITIS.

INHALATION - EXCESSIVE INHALATION OF VAPORS CAN CAUSE NASAL, AND RESPIRATORY IRRITATION, DIZZINESS, WEAKNESS, FATIGUE, NAUSEA, HEADACHE, POSSIBLE UNCONSCIOUSNESS, AND EVEN ASPHYXIATION.

INGESTION - CAN CAUSE GASTROINTESTINAL IRRITATION, NAUSEA, VOMITING, DIARRHEA.

CHRONIC OVEREXPOSURE - NONE KNOWN

FIRST AID:

EYE CONTACT - FLUSH EYES WITH LARGE AMOUNTS OF WATER, LIFTING UPPER AND LOWER LIDS OCCASIONALLY. GET MEDICAL ATTENTION.

SKIN CONTACT - THOROUGHLY WASH EXPOSED AREA WITH SOAP AND WATER. REMOVE CONTAMINATED CLOTHING. LAUNDER CONTAMINATED CLOTHING BEFORE RE-USE.

INHALATION - IF AFFECTED, REMOVE INDIVIDUAL TO FRESH AIR. IF BREATHING IS DIFFICULT, ADMINISTER OXYGEN. IF BREATHING HAS STOPPED GIVE ARTIFICIAL RESPIRATION. KEEP PERSON WARM, QUIET AND GET MEDICAL ATTENTION.

INGESTION - LOW TOXICITY- INDUCE VOMITING IF LARGE AMOUNTS ARE INGESTED. GIVE TWO GLASSES OF WATER, INDUCE VOMITING IMMEDIATELY BY STICKING FINGER DOWN THROAT. CALL A PHYSICIAN. NEVER GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON.

MINERAL SPIRITS

(64742-86-7)

ACUTE OVEREXPOSURE - CAN LEAD TO CENTRAL NERVOUS SYSTEM DEPRESSION PRODUCING SUCH EFFECTS AS HEADACHE, DIZZINESS, NAUSEA, AND LOSS OF CONSCIOUSNESS.

EYE CONTACT - SHORT TERM LIQUID OR VAPOR CONTACT MAY RESULT IN SLIGHT EYE IRRITATION. PROLONGED AND REPEATED CONTACT MAY BE MORE IRRITATING.

SKIN CONTACT - PROLONGED AND REPEATED LIQUID CONTACT CAN CAUSE DEFATTING AND DRYING OF THE SKIN WHICH MAY RESULT IN SKIN IRRITATION AND DERMATITIS.

INHALATION - HIGH CONCENTRATIONS OR PROLONGED EXPOSURE TO LOWER CONCENTRATIONS MAY BE SLIGHTLY IRRITATING TO MUCOUS MEMBRANES.

INGESTION - LIQUID INGESTION MAY RESULT IN VOMITING; ASPIRATION (BREATHING IN) OF LIQUID MUST BE AVOIDED AS LIQUID CONTACT WITH THE LUNGS CAN RESULT IN CHEMICAL PNEUMONITIS AND PULMONARY EDEMA/HEMORRHAGE.

FIRST AID:

EYE CONTACT - FLUSH WITH WATER. IF PERSISTENT IRRITATION OCCURS, GET MEDICAL ATTENTION.

SKIN CONTACT - WASH WITH SOAP AND WATER. REMOVE CONTAMINATED CLOTHING AND DO NOT REUSE UNTIL LAUNDERED. IF PERSISTENT IRRITATION OCCURS, GET MEDICAL ATTENTION.

INHALATION - REMOVE TO FRESH AIR AND PROVIDE OXYGEN IF BREATHING IS DIFFICULT. GIVE ARTIFICIAL RESPIRATION IF NOT BREATHING. GET MEDICAL ATTENTION.

INGESTION - DO NOT INDUCE VOMITING EVEN THOUGH VOMITING MAY OCCUR. IF VOMITING OCCURS, KEEP HEAD BELOW HIPS TO PREVENT ASPIRATION OF LIQUID INTO THE LUNGS. GET MEDICAL ATTENTION.

VARNISH MAKERS & PAINTER

NAPHTHA (8030-30-6)

#18-20

ACUTE OVEREXPOSURE - CENTRAL NERVOUS SYSTEM DEPRESSION IN HIGH CONCENTRATIONS.

EYE CONTACT - MAY BE AN EYE IRRITANT.

SKIN CONTACT - PROLONGED OR REPEATED CONTACT MAY CAUSE SKIN IRRITATION.

2.4 of 5
SPACE
GROSS
ORANGE

FIRST AID:

EYE CONTACT - FLUSH EYES WITH LARGE QUANTITIES OF WATER FOR AT LEAST 15 MINUTES AND SEEK IMMEDIATE MEDICAL ATTENTION.

SKIN CONTACT - WASH AFFECTED AREA WITH SOAP AND LARGE QUANTITIES OF WATER. WASH CONTAMINATED CLOTHING BEFORE REUSE.

INHALATION - IF BREATHING DIFFICULTIES, DIZZINESS, OR LIGHTEADEDNESS OCCUR WHEN WORKING IN AREAS WITH HIGH VAPOR CONCENTRATIONS, VICTIM SHOULD SEEK AIR FREE OF VAPORS. IF VICTIM EXPERIENCES CONTINUED BREATHING DIFFICULTIES, ADMINISTER OXYGEN UNTIL MEDICAL ASSISTANCE CAN BE RENDERED. IF BREATHING STOPS, BEGIN ARTIFICIAL RESPIRATION AND SEEK IMMEDIATE MEDICAL ATTENTION.

INGESTION - IF SWALLOWED, DO NOT INDUCE VOMITING. SEEK IMMEDIATE MEDICAL ADVICE AND/OR ATTENTION.

XYLENE

(1330-20-7)

ACUTE OVEREXPOSURE -

EYE CONTACT - MAY BE AN EYE IRRITANT.

SKIN CONTACT - MAY CAUSE SKIN IRRITATION UPON PROLONGED OR REPEATED CONTACT.

INHALATION - IRRITANT TO UPPER RESPIRATORY SYSTEM. CAN CAUSE HEADACHE, NAUSEA, AND DIZZINESS.

INGESTION - MAY BE HARMFUL IF SWALLOWED.

CHRONIC OVEREXPOSURE -

POSSIBLE LIVER AND KIDNEY DAMAGE.

FIRST AID:

EYE CONTACT - FLUSH EYES WITH LARGE QUANTITIES OF WATER FOR AT LEAST 15 MINUTES AND SEEK IMMEDIATE MEDICAL ATTENTION.

SKIN CONTACT - WASH SKIN WITH SOAP AND LARGE QUANTITIES OF WATER AND SEEK MEDICAL ATTENTION IF IRRITATION FROM CONTACT PERSISTS.

INHALATION - IF BREATHING DIFFICULTIES, DIZZINESS, OR LIGHTEADEDNESS OCCUR WHEN WORKING IN AREAS WITH HIGH VAPOR CONCENTRATIONS, VICTIM SHOULD SEEK AIR FREE OF VAPORS. IF VICTIM EXPERIENCES CONTINUED BREATHING DIFFICULTIES, ADMINISTER OXYGEN UNTIL MEDICAL ASSISTANCE CAN BE RENDERED. IF BREATHING STOPS, BEGIN ARTIFICIAL RESPIRATION AND SEEK IMMEDIATE MEDICAL ATTENTION.

INGESTION - IF SWALLOWED, DO NOT INDUCE VOMITING. SEEK IMMEDIATE MEDICAL ADVICE AND/OR ATTENTION.

HEXANE

(110-54-3)

ACUTE OVEREXPOSURE -

EYES - CAN CAUSE SEVERE IRRITATION, REDNESS, TEARING, BLURRED VISION.

SKIN - PROLONGED OR REPEATED CONTACT CAN CAUSE MODERATE IRRITATION, DEFATTING, DERMATITIS.

INHALATION - EXCESSIVE INHALATION OF VAPORS CAN CAUSE NASAL AND RESPIRATORY IRRITATION, DIZZINESS, WEAKNESS, FATIGUE, NAUSEA, HEADACHE, POSSIBLE UNCONSCIOUSNESS, AND EVEN ASPHYXIATION.

INGESTION - CAN CAUSE GASTROINTESTINAL IRRITATION, NAUSEA, VOMITING, AND DIARRHEA. ASPIRATION OF MATERIAL INTO THE LUNGS CAN CAUSE CHEMICAL PNEUMONITIS WHICH CAN BE FATAL.

CHRONIC OVEREXPOSURE -

INFORMATION SUGGESTS THAT HEXANE HAS THE POTENTIAL OF CAUSING SERIOUS NERVE IMPAIRMENT AND POSSIBLE EVEN NERVE DAMAGE KNOWN AS

PERIPHERAL NEUROPATHY ON PROLONGED OR REPEATED OVEREXPOSURE.

#98-2

FIRST AID:

EYE CONTACT - FLUSH EYES WITH LARGE AMOUNTS OF WATER, LIFTING UPPER AND LOWER LIDS OCCASIONALLY, GET MEDICAL ATTENTION.

SKIN CONTACT - THOROUGHLY WASH EXPOSED AREA WITH SOAP AND WATER. REMOVE CONTAMINATED CLOTHING. LAUNDER CONTAMINATED CLOTHING BEFORE RE-USE.

INHALATION - IF AFFECTED, REMOVE INDIVIDUAL TO FRESH AIR. IF BREATHING IS DIFFICULT, ADMINISTER OXYGEN. IF BREATHING HAS STOPPED GIVE ARTIFICIAL RESPIRATION. KEEP PERSON WARM, QUIET AND GET MEDICAL ATTENTION.

INGESTION - IF SWALLOWED, DO NOT INDUCE VOMITING. KEEP PERSON WARM, QUIET, AND GET MEDICAL ATTENTION. ASPIRATION OF MATERIAL INTO LUNGS DUE TO VOMITING CAN CAUSE CHEMICAL PNEUMONITIS WHICH CAN BE FATAL.

SECTION 6 - REACTIVITY DATA

STABILITY: STABLE CONDITIONS TO AVOID: DO NOT STORE ABOVE 120 DEG. F. KEEP FROM SPARKS, PILOT LIGHTS OR OPEN FLAME.

INCOMPATIBILITY: (MATERIALS TO AVOID) NONE KNOWN

HAZARDOUS DECOMPOSITION PRODUCTS: MAY PRODUCE HAZARDOUS FUMES WHEN HEATED TO DECOMPOSITION. FUMES MAY CONTAIN CARBON DIOXIDE AND/OR CARBON MONOXIDE.

HAZARDOUS POLYMERIZATION: WILL NOT OCCUR.

CONDITIONS TO AVOID: NA

SECTION 7 - SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: REMOVE ALL SOURCES OF IGNITION, AVOID BREATHING VAPORS, VENTILATE AREA. WIPE UP WITH INERT MATERIALS AND PLACE IN APPROPRIATE CONTAINER.

WASTE DISPOSAL METHODS: DO NOT INCINERATE AEROSOL, DISPOSE OF IN ACCORDANCE WITH LOCAL, STATE AND FEDERAL REGULATIONS. DO NOT PLACE AEROSOL CANS IN HOME COMPACTOR. DO NOT PUNCTURE.

SECTION 8 - SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION: AVOID CONTINUOUS BREATHING OF VAPORS AND SPRAY MIST. A SELF CONTAINED BREATHING APPARATUS REQUIRED FOR CONCENTRATIONS ABOVE TLV LIMITS.

VENTILATION: USE WITH ADEQUATE VENTILATION, SUFFICIENT TO PREVENT INHALATION OF SOLVENT VAPORS.

PROTECTIVE GLOVES: OPTIONAL

EYE PROTECTION: ONLY UNDER CONDITIONS WHERE SPRAY MIST MIGHT GET INTO EYES.

SECTION 9 - SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING: DO NOT STORE ABOVE 120 DEG. F. EXPOSURE TO HEAT OR PROLONG EXPOSURE TO SUN MAY CAUSE BURSTING.

OTHER PRECAUTIONS: USE ONLY AS DIRECTED. INTENTIONAL MISUSE BY DILIBERATELY CONCENTRATING VAPORS AND INHALING CONTENTS CAN BE HARMFUL OR FATAL.

P.545
SPRUCK
GLOSS
ORANGE

U.S. DEPARTMENT OF LABOR
Occupational Safety and Health Administration

Form Approved
OMB No. 44-R1387

MATERIAL SAFETY DATA SHEET

CERRO COPPER PRODUCTS COMPANY
MSDS NUMBER - CCPC-90-0195

418 K

Pepco 418

Required under US
Shipbuilding,

SECTION I

MANUFACTURER'S NAME Peck's Products Company		EMERGENCY TELEPHONE NO. (314) 385-5454
ADDRESS (Number, Street, City, State, and ZIP Code) 610 East Clarence Street St. Louis, MO 63147		
CHEMICAL NAME AND SYNONYMS	TRADE NAME AND SYNONYMS Pepco 418	
CHEMICAL FAMILY Soap	FORMULA Mixture of Powders	

SECTION II - HAZARDOUS INGREDIENTS

PAINTS, PRESERVATIVES, & SOLVENTS	%	TLV (Units)	ALLOYS AND METALLIC COATINGS	%	TLV (Units)
PIGMENTS	0		BASE METAL	0	
CATALYST	0		ALLOYS	0	
VEHICLE	0		METALLIC COATINGS	0	
SOLVENTS	0		FILLER METAL PLUS COATING OR CORE FLUX	0	
ADDITIVES	0		OTHERS	0	
OTHERS	0				
HAZARDOUS MIXTURES OF OTHER LIQUIDS, SOLIDS, OR GASES				%	TLV (Units)
None					

SECTION III - PHYSICAL DATA

BOILING POINT (°F.)	NA	SPECIFIC GRAVITY (H ₂ O=1)	NA
VAPOR PRESSURE (mm Hg.)	NA	PERCENT, VOLATILE BY VOLUME (%)	0
VAPOR DENSITY (AIR=1)	NA	EVAPORATION RATE (_____ = 1)	0
SOLUBILITY IN WATER	50%	pH (2.5% Solution)	9.7
APPEARANCE AND ODOR	Lt. Brown powder, lavalaria odor		

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (Method used) NA	FLAMMABLE LIMITS NA	Lel	Uel
EXTINGUISHING MEDIA NA			
SPECIAL FIRE FIGHTING PROCEDURES			
None			
UNUSUAL FIRE AND EXPLOSION HAZARDS			
None			

SECTION V - HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE

NOT ESTABLISHED

EFFECTS OF OVEREXPOSURE

Dust may cause eye or now irritation in poorly ventilated areas

EMERGENCY AND FIRST AID PROCEDURES

Flush with water. If irritation persists get medical attention.

SECTION VI - REACTIVITY DATA

STABILITY

UNSTABLE

CONDITIONS TO AVOID

NONE

STABLE

X

INCOMPATIBILITY (Materials to avoid)

None

HAZARDOUS DECOMPOSITION PRODUCTS

None

HAZARDOUS
POLYMERIZATION

MAY OCCUR

CONDITIONS TO AVOID

NONE

WILL NOT OCCUR

X

SECTION VII - SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

No special precautions

WASTE DISPOSAL METHOD

Flush with water

SECTION VIII - SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION (Specify type)

DUST MASK MAY BE NECESSARY IN POORLY VENTILATED AREAS

VENTILATION

LOCAL EXHAUST

NONE

SPECIAL

NONE

MECHANICAL (General)

NONE

OTHER

NONE

PROTECTIVE GLOVES

Not necessary

EYE PROTECTION

Not necessary

OTHER PROTECTIVE EQUIPMENT

NONE

SECTION IX - SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING

KEEP OUT OF REACH OF CHILDREN

OTHER PRECAUTIONS

NONE

Company / Plant National Refractories & Minerals Corp. One Kaiser Plaza, Suite 650 Oakland, California 94612	Issue Date Revised August 6, 1985	Identification Number NA
Trade Name (Common Name or Synonym) Permanente 165 AF	Emergency Phone Number (415) 462-1147	
Chemical Name NA	Formula NA	DOT Identification Number NA

I. INGREDIENTS:

Material or Component
<p>In the amounts present, no substance has known toxicity greater than listed for nuisance dusts. (See Section V).</p> <p>1984-85 ACGIH TLV's : 5 mg/m³ respirable dust, 10 mg/m³ total dust. OSHA 1910.1000 PEL's : 5 mg/m³ respirable dust, 15 mg/m³ total dust.</p>

II. PHYSICAL DATA

Material is (At Normal Conditions): <input type="checkbox"/> Liquid <input type="checkbox"/> Solid <input type="checkbox"/> Gas <input checked="" type="checkbox"/> Other Granular, dry		Appearance and Odor Size: -4 mesh Color: Grey Odor: None	
Acidity/Alkalinity pH = NA	Melting Point Boiling Point	NA NA °F °F	Specific Gravity (H ₂ O = 1) 2.7-3.1 Solubility in water (% by weight) <5
			Vapor Pressure (mm Hg at 20°C) NA

III. PERSONAL PROTECTIVE EQUIPMENT

Respiratory Protection Respirator for particulates approved by NIOSH/MSHA and adequate for contaminant concentrations encountered.	Hands, Arms, and Body Gloves are recommended
Eyes and Face Safety glasses are recommended.	Other Clothing and Equipment NA

IV. EMERGENCY MEDICAL PROCEDURES

<p>1. Skin: Wash with soap and water. 2. Eyes: Irrigate immediately with plenty of water. Obtain medical attention if necessary.</p>
--

V. HEALTH/SAFETY INFORMATION

Health	Inhalation	Nuisance dusts have little adverse effect on lungs and do not produce significant disease or toxic effect when exposures are kept under the TLV or PEL.			
	Ingestion	NA			
	Skin	May cause skin irritation on prolonged or repeated contact.			
	Eyes	May irritate or injure eyes.			
Threshold Limit Value		See Section I			
Fire and Explosion	Flash Point °F	Auto Ignition Temperature		Flammable Limits in Air	Extinguishing Media
	NA <input checked="" type="checkbox"/> Not Flammable	NA °F		Lower NA % Upper NA %	NA
	Unusual Fire and Explosion Hazards				Extinguishing Media Not to be Used
	NA				NA
Reactivity	Stability <input checked="" type="checkbox"/> Stable <input type="checkbox"/> Unstable	Incompatibility (Materials to Avoid)			
		NA			
	Conditions to Avoid				
	NA				
Hazardous Decomposition Products		NA			

VI. ENVIRONMENTAL

Spill or leak procedures

We recommend that the purchaser establish a spill prevention, control and counter measure plan. This plan should include procedures for proper storage as well as clean-up of spills or leaks. The procedures should conform to safe practices and provide for proper recovery or disposal. Depending on the quantity spilled, notification of the National Response Center (800-424-8802) may be required in case of hazardous substances. (See EPA and DOT regulations; also various state and local regulations.)

Waste Disposal Method*

Used or unused product should be tested to determine hazard status and disposal requirements under federal, State or local laws and regulations.

*Disposer must comply with Federal, State and Local disposal or discharge laws.

VII. ADDITIONAL INFORMATION

1. Do not breathe dust.
2. Toxic risk may be altered by chemical or physical changes caused by conditions of use.
3. Permanente 165 AF is a refractory ram-cast-gun mix.

The information in this MSDS was obtained from sources which we believe are reliable. However, the information is provided without any representation or warranty, express or implied, regarding the accuracy or correctness.

The conditions or methods of handling, storage, use and disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of the product.



810 LINCOLN AVE.
PO. BOX 598
WEST CHESTER
PA 19381-0598
(215) 696-6770
FAX: (215) 430-8431
TELEX: 880993

GERRO COPPER PRODUCTS COMPANY
MSDS NUMBER - CCPC-00-0198
APPROVALS
ENVIRONMENTAL _____ (PRICE)
SAFETY _____ (PRICE)
HUMAN HEALTH _____ (PRICE)

1991 Notice

The chemicals listed below are present in Phosphor Copper and are subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 on 40 CFR, Part 372. This notice must be attached to the current Material Safety Data Sheet for Phosphor Copper which has been supplied to you by Metallurgical Products Company and may not be removed for any reason.

15% PHOSPHOR COPPER

<u>Chemical</u>	<u>CAS Number</u>	<u>% by Weight</u>
Phosphor	7723-14-0	15
Copper	7440-50-8	85

13.5% PHOSPHOR COPPER

<u>Chemical</u>	<u>CAS Number</u>	<u>% by Weight</u>
Phosphor	7723-14-0	13.5
Copper	7440-50-8	86.5

10% PHOSPHOR COPPER

<u>Chemical</u>	<u>CAS Number</u>	<u>% by Weight</u>
Phosphor	7723-14-0	10
Copper	7440-50-8	90

8% PHOSPHOR COPPER

<u>Chemical</u>	<u>CAS Number</u>	<u>% by Weight</u>
Phosphor	7723-14-0	8
Copper	7440-50-8	92

PHOSPHOR COPPER

Phosphorus (P)

C.A.S. No. 7723-14-0

OSHA PEL: 0.1 mg/M³

Copper (Cu)

C.A.S. No. 7440-50-8

OSHA PEL: 1 mg/M³ (mist and dust)
0.1 mg/M³ (fume)

PHYSICAL DATA

Appearance: Shot form - Silver grey in color.
Waffle form - Dull grey in color

Melting Point: 1015° C 15% P Cu
900° C 13.5% P Cu
840° C 10% P Cu
700° C 8% P Cu

PHYSIOLOGICAL EFFECTS

Inhalation of phosphorus vapors has caused respiratory tract irritation. Chronic intoxication includes gastrointestinal distress and garlic breath. A classical effect of chronic phosphorus intoxication is necrosis of the jaw.

Industrial exposure to copper fumes, dusts, or mists result in metal fume fever with atrophic changes in nasal mucous membranes. Chronic poisoning results in Wilsons disease, characterized by a hepatic cirrhosis, brain damage, demyelination, renal disease, and copper deposition in the cornea.

REACTIVITY DATA

Copper reacts violently with acetylene, ammonium nitrate, bromates, chlorates, iodates, chlorine, ClF₃, ethylene oxide, fluoride, hydrogen peroxide, hydrazic acid, hydrogen sulfide, Pb (N₃)₂, K₂O₂, NaN₃, and Na₂O₂.

Copper is incompatible with 1-bromo-2-propyne.

Copper fume is incompatible with acetylene gas.

Copper dust and mist are incompatible with acetylene gas and magnesium metal.

Phosphorus is incompatible with potassium chlorate, potassium permanganate, peroxides, and oxidizing materials. It can react with reducing materials. When heated, phosphorus emits highly toxic fumes of PO_x.

MSDS Reference: C <u>1103P-114</u> <u>00032</u>	
Date Prepared: <u>11/25/85</u>	
Rev. 6/30/86	
MATERIAL SAFETY DATA SHEET	
CERRO COPPER PRODUCTS COMPANY MSDS NUMBER - CERP-CO-0198	
U.S. _____	
MANUFACTURER'S NAME H. Kramer & Co.	
EMERGENCY TELEPHONE NO. (312) 226-6600	
ADDRESS (Number, Street, City, State, and ZIP Code) 1339 W. 21st Street - Chicago, IL 60608	
CHEMICAL NAME AND SYNONYMS 15% Phosphor Copper	TRADE NAME AND SYNONYMS
CHEMICAL FAMILY Copper Base Alloy	FORMULA ASTM B644 Alloy 3A

SECTION II - HAZARDOUS INGREDIENTS		
ELEMENT	PERCENTAGE	TLV ACGIH 8-HR TWA MG/M3
Copper and Phosphor	99.75 Min.	1
Phosphor	14.00 Min.	.1
Iron	.15 Max	5 Fume
** This material is inert and non-toxic in the solid state **		

SECTION III - PHYSICAL DATA	
BOILING POINT (F°)	SPECIFIC GRAVITY (H ₂ O=1) <u>7.36</u>
Copper <u>4703°</u>	MOLTEN STATE OPERATING TEMPERATURE IS <u>1830°</u> TO <u>2500°</u> F. IN THIS RANGE ONLY <u>Phosphorus</u> BOILS OFF CARRYING WITH IT SMALL AMOUNTS OF OTHER METALS AS OXIDES.
Phosphor <u>546</u>	
Iron <u>5430</u>	
APPEARANCE & ODOR: <u>ODORLESS: Grey Silver Metal</u>	

SECTION IV - FIRE AND EXPLOSION HAZARD DATA					
FLASH POINT (Method used)	N/A	FLAMMABLE LIMITS (ZV)	<table border="1" style="width: 100%; border-collapse: collapse;"><tr><td style="width: 50%; text-align: center;">L_{FL} N/A</td><td style="width: 50%; text-align: center;">U_{FL} N/A</td></tr></table>	L _{FL} N/A	U _{FL} N/A
L _{FL} N/A	U _{FL} N/A				
EXTINGUISHING MEDIA					
Dry chemicals or sand should be used with molten metals.					
SPECIAL FIRE FIGHTING PROCEDURES					
Fire fighters should wear full protective clothing.					
UNUSUAL FIRE AND EXPLOSION HAZARDS					
Do not use water on molten metals.					

SECTION V - HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE

See Section II

EFFECTS OF OVEREXPOSURE

See Attachment Items 8, 14, 9

EMERGENCY AND FIRST AID PROCEDURES

See Attachment Items 8, 14, 9

MATERIAL IS NOT A KNOWN CARCINOGEN

Fumes and/or nuisance dust will aggravate existing respiratory problems-

SECTION VI - REACTIVITY DATA

STABILITY	UNSTABLE		CONDITIONS TO AVOID
	STABLE	X	N/A
INCOMPATIBILITY (Materials to avoid)			
HAZARDOUS DECOMPOSITION PRODUCTS N/A			
HAZARDOUS POLYMERIZATION	MAY OCCUR		CONDITIONS TO AVOID
	WILL NOT OCCUR	X	N/A

SECTION VII - SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

Special care should be taken when

handling molten metal. Accumulations of dust should be vacuumed or wet-swept to prevent airborne exposures.

WASTE DISPOSAL METHOD

Metal turnings, chips, risers, grindings, etc. are recycled.

Zinc oxide dust collected in exhaust systems is sold.

SECTION VIII - SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION (Specify type)

NIOSH Certified (3M 9920, etc.)

VENTILATION

LOCAL EXHAUST

X

SPECIAL

MECHANICAL (General)

OTHER

PROTECTIVE GLOVES

Industrial Type

EYE PROTECTION

Safety Glasses/Goggles/Shields

OTHER PROTECTIVE EQUIPMENT

Compliance with OSHA Regulations and other accepted safety and hygiene practices.

SECTION IX - SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING

Material in storage can become wet from condensation. It must be thoroughly dried before adding to molten metal. See other sections, references and sources.

1. ALUMINUM EFFECTS OF EXPOSURE: FUMES ARE A LOW HEALTH RISK BY INHALATION. DEFINED AS A NUISANCE BY (ACGIH)
EMERGENCY & FIRST AID TREATMENT: NO MEDICAL TREATMENT NECESSARY.
2. ANTIMONY EFFECTS OF EXPOSURE: MAY CAUSE IRRITATION TO SKIN/CONTACT DERMATITIS. INHALATION CAN CAUSE INFLAMMATION OF THE UPPER & LOWER RESPIRATORY TRACTS. CHRONIC POISONING SYMPTOMS ARE DRYNESS OF THROAT, NAUSEA, HEADACHES, SLEEPLESSNESS, LOSS OF APPETITE AND DIZZINESS. IN ACUTE SEVERE POISONING THERE MAY BE DEATH FROM CIRCULATORY OR RESPIRATORY FAILURE OR TOXIC HEPATITIS.
EMERGENCY & FIRST AID TREATMENT: REMOVE FROM EXPOSURE AND HAVE BIOLOGICAL MONITORING UNDER DIRECTION OF A PHYSICIAN.
3. BERYLLIUM ... EFFECTS OF EXPOSURE: ENTERS THE BODY ALMOST ENTIRELY BY INHALATION AND CAN CAUSE SYSTEMIC DISEASE OF LONG DURATION. SYMPTOMS ARE WEAKNESS, EASY FATIGUE AND WEIGHT LOSS.
EMERGENCY & FIRST AID TREATMENT: REMOVE FROM EXPOSURE. ON OVEREXPOSURE OBTAIN PROMPT MEDICAL CARE BY A PHYSICIAN.
4. CADMIUM..... EFFECTS OF EXPOSURE: INHALATION MAY LEAD TO CHEMICAL PNEUMONITIS AND SEVERE CASES PULMONARY EDEMA. SYMPTOMS ARE INFLUENZA-LIKE SIMILAR METAL-FUME FEVER & GENERALLY OCCUR WITHIN A 8 HOUR PERIOD. IN SEVERE CASES DEATH CAN OCCUR AFTER 4 TO 7 DAYS. IT SHOULD BE STRESSED THAT CADMIUM INDUCED KIDNEY DAMAGE IS IRREVERSIBLE.
EMERGENCY & FIRST AID TREATMENT: REMOVE FROM EXPOSURE AND GIVE OXYGEN THERAPY IF NECESSARY. OBTAIN PROMPT MEDICAL CARE.
5. CARBON EFFECTS OF EXPOSURE: LOW HEALTH RISK BY INHALATION.
EMERGENCY & FIRST AID TREATMENT: NO MEDICAL TREATMENT NECESSARY IN ITS PURE FORM.
6. CHROMIUM EFFECTS OF EXPOSURE: CAN CAUSE SKIN AND MUCOUS MEMBRANE IRRITATION, DERMATITIS AND CHROME ULCERATION.
EMERGENCY & FIRST AID TREATMENT: WASH SKIN THOROUGHLY AFTER CONTACT. OBTAIN MEDICAL CARE FOR CHROME ULCERATION.
7. COBALT EFFECTS & EXPOSURE: INHALATION OF FUME WILL PRODUCE SYSTEMIC POISONING WITH MYOCARDIAL DISORDERS AND IRRITANT EFFECTS ON THE AIRWAYS, EYES AND DIGESTIVE TRACT. SYMPTOMS RANGE FROM SHORTNESS OF BREATH TO COUGHING.
EMERGENCY & FIRST AID TREATMENT: NO ANTIDOTE EXISTS. MONITORING BY A PHYSICIAN WITH PARTICULAR ATTENTION TO THE CARDIOVASCULAR SYSTEM ADVISABLE.
8. COPPER EFFECTS & EXPOSURE: FUMES CAN CAUSE NAUSEA, GASTRIC PAIN, DIARRHEA AND IRRITATION TO THE UPPER RESPIRATORY TRACT. SYMPTOMS ARE OFTEN A METALLIC TASTE.
EMERGENCY & FIRST AID TREATMENT: REMOVE FROM EXPOSURE.
9. IRON EFFECTS & EXPOSURE: INHALATION OF OXIDE OR DUST CAN RESULT IN SIDEROSIS WHICH CAUSES A SHORTNESS OF BREATH AND COUGHING TENDENCIES.
EMERGENCY & FIRST AID TREATMENT: REMOVE FROM EXPOSURE & OBTAIN MEDICAL ATTENTION.
10. LEAD EFFECTS & EXPOSURE: SHORT TERM EXPOSURE SYMPTOMS MAY INCLUDE STOMACH CRAMPS, PERSISTENT VOMITING, SEVERE ANEMIA, PERIPHERAL NEUROPATHY AND ACUTE ENCEPHALOPATHY FOLLOWED BY COMA, CARDIORESPIRATORY ARREST AND DEATH. LONG TERM EXPOSURE SYMPTOMS ARE THE ABOVE WITH A METALLIC TASTE IN MOUTH. WEAKNESS OF EXTENSOR MUSCLES OF THE WRIST & ANKLES IS NOTICEABLE IN SERIOUS CASES.

EMERGENCY & FIRST AID TREATMENT: NO IMMEDIATELY FIRST AID IS GENERALLY NECESSARY. BIOLOGICAL MONITORING UNDER THE DIRECTION OF A PHYSICIAN IS REQUIRED IN ACCORDANCE WITH OSHA REGULATIONS.

1. MAGNESIUM ... EFFECTS & EXPOSURE: HEAVY EXPOSURE TO FUME MAY BE IRRITATING TO EYES, NOSE AND THROAT. CAN CAUSE METAL-FUME FEVER.
EMERGENCY & FIRST AID TREATMENT: EYE WASH STATION FACILITIES SHOULD BE USED IMMEDIATELY. NO CONTACT LENSES SHOULD BE WORN IN THIS AREA.
12. MANGANESE ... EFFECTS & EXPOSURE: MODERATELY TOXIC. MAY CAUSE NOSE TO BLEED, IRRITATION TO THE THROAT AND SKIN. PROLONGED EXPOSURE CAN EFFECT THE CENTRAL NERVOUS SYSTEM.
EMERGENCY & FIRST AID TREATMENT: ON IRRITATION WASH THOROUGHLY. ON INGESTION INDUCE VOMITING. OBTAIN MEDICAL ATTENTION.
13. NICKEL EFFECTS & EXPOSURE: OFTEN CAUSES ALLERGIC DERMATITIS. INHALATION CAN CAUSE HYPERTROPHIC RHINITIS AND NASAL SINUSITIS. IN EXTREME CASES IT IS SUSPECTED OF CAUSING CANCER OF THE NASAL CAVITIES, LUNGS AND OTHER ORGANS.
EMERGENCY & FIRST AID TREATMENT: ANNUAL MEDICAL MONITORING BY A PHYSICIAN IS RECOMMENDED IN AREAS WHERE CONCENTRATIONS ARE GREATER THAN 15 UGNI/M3 TWA FOR A 40 HOUR WORK WEEK.
14. PHOSPHOROUS . EFFECTS & EXPOSURE: INHALATION MAY CAUSE OSTEOMYELITIS OF THE JAW BONE. SKIN CONTACT BY BURNING PHOSPHOROUS SLIVERS WILL CAUSE SEVERE BURNS.
EMERGENCY & FIRST AID TREATMENT: DOUSE BURNING SLIVERS WITH A 1 - 5% SOLUTION OF AQUEOUS COPPER SULPHATE. THEN REMOVE SLIVERS WITH LARGE QUANTITIES OF WATER. MEDICAL ADVISE NEED BE SOUGHT IN CASES OF OSTEOMYELITIS.
15. SILICON EFFECTS & EXPOSURE: IN A COLD STATE SILICON IS NOT DANGEROUS.
EMERGENCY & FIRST AID TREATMENT: NONE NECESSARY
16. SILVER EFFECTS & EXPOSURE: LOCALIZED ARGYRIA IS CAUSED BY SILVER PARTICLES ON THE SKIN. EXCEPT FOR A BLUISH COSMETIC DISFIGUREMENT IT IS GENERALLY CONSIDERED BENIGN.
EMERGENCY & FIRST AID TREATMENT: NONE NECESSARY
17. TIN EFFECTS & EXPOSURE: TIN POWDER IS MODERATELY IRRITANT TO THE EYES AND AIRWAYS.
EMERGENCY & FIRST AID TREATMENT: REMOVE FROM EXPOSURE.
18. ZINC EFFECTS AND EXPOSURE: EXPOSURE TO ZINC OXIDE FUME CAN CAUSE METAL-FUME FEVER. SYMPTOMS RESEMBLE INFLUENZA W/ CHILLS & NAUSEA.
EMERGENCY & FIRST AID TREATMENT: USUALLY LASTS LESS THAN 24 HOURS WITH NO KNOWN TREATMENT OR LASTING ILL EFFECTS.

THE ABOVE INFORMATION IS PROVIDED FOR THE SOLE PURPOSE OF ASSESSING POTENTIAL HAZARDS THAT MIGHT ARISE FROM THE USE OF THIS MATERIAL. THE INFORMATION IS GIVEN IN GOOD FAITH AND IS BELIEVED TO BE CORRECT, BUT WITHOUT GUARANTEE. WE DO NOT ASSUME RESPONSIBILITY FOR THE RESULTS OF ITS USE.

SOURCES

- 'HANDBOOK OF HAZARDOUS MATERIALS' (2ND EDITION) .. ALLIANCE OF AMERICAN INSURERS
- 'ENCYCLOPAEDIA OF OCCUPATIONAL HEALTH & SAFETY' (VOL I & II) INTERNATIONAL LABOUR OFFICE
- 'THRESHOLD LIMIT VALUES FOR CHEMICAL SUBSTANCES IN WORK ENVIRONMENT' .. ACGIH
- 'METALS HANDBOOK .. PROPERTIES OF METALS (8TH ED ..VOL I) .. AMERICAN SOCIETY FOR METALS
- 'STANDARDS HANDBOOK' (PART 7) COPPER DEVELOPMENT ASSOCIATION INC.

MONSANTO PRODUCT NAME

PHOSPHORIC ACID

MONSANTO COMPANY
 800 N. LINDBERGH BLVD.
 ST. LOUIS, MO 63167

Emergency Phone No.
(Call Collect)
314-694-1000

PRODUCT IDENTIFICATION

Synonym(s):	Phos acid; Orthophosphoric acid
Chemical Name:	Phosphoric acid
Chemical Formula:	H ₃ PO ₄
Chemical Family:	Mineral acid
CAS No.:	7664-38-2
TSCA Inventory:	Phosphoric acid appears on the Inventory of Chemical Substances published by the U. S. Environmental Protection Agency (EPA) under authority of the Toxic Substances Control Act (TSCA).
Dot Proper Shipping Name:	Phosphoric Acid
Dot Hazard Class/ I.D. No.:	Corrosive material/UN1805
DOT Label(s):	Corrosive
U.S. Surface Freight Classification:	Phosphoric Acid
Reportable Quantity (RQ) Under U.S. EPA CERCLA Regulations:	5,000 lbs.
Hazardous Chemical(s) Under OSHA Hazard Communication Standard:	The substance listed below is identified as a hazardous chemical under the criteria of the OSHA Hazard Communication Standard (29 CFR 1910.1200): Phosphoric acid, CAS Reg. No. 7664-38-2

WARNING STATEMENTS

DANGER!
CAUSES BURNS TO EYES AND SKIN

PRECAUTIONARY MEASURES

Do not get in eyes, on skin, on clothing.
 Avoid breathing mist.
 Keep container closed.
 Use with adequate ventilation.
 Wash thoroughly after handling.

Emptied container retains vapor and product residue. Observe all labeled safeguards until container is cleaned, reconditioned or destroyed.

CORROSIVE TO MILD STEEL

MATERIAL SAFETY DATA
 Phosphoric Acid

EMERGENCY AND FIRST AID PROCEDURES

FIRST AID: IF IN EYES OR ON SKIN, immediately flush with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Call a physician. Wash clothing before reuse.

IN CASE OF: SPILL OR LEAK, contain spills and leaks to prevent discharge to the environment.

OCCUPATIONAL CONTROL PROCEDURES

Eye Protection: Wear chemical safety goggles to prevent eye contact. Have eye baths immediately available where eye contact can occur.

Skin Protection: Wear appropriate impervious gloves and protective clothing to prevent skin contact. Wear face shields and impervious aprons when splashing is likely. Remove contaminated clothing promptly and launder before reuse. Provide safety shower at any location where skin contact can occur. Wash contaminated skin promptly.

Respiratory Protection: Use NIOSH approved equipment with full facepiece when airborne exposure limits are exceeded. Consult respirator manufacturer to determine appropriate type equipment for given application.

Ventilation: Provide ventilation to minimize exposure. Local exhaust ventilation preferred.

Airborne Exposure Limits:

Typical Product Composition: Phosphoric acid in water

OSHA PEL/TWA: 1 mg/m³
ACGIH TLV^{*}/TWA: 1 mg/m³
TLV^{*}/STEL: 3 mg/m³

FIRE PROTECTION INFORMATION

Extinguishing Media: Although phosphoric acid is not combustible, it can react with metals to liberate hydrogen, a flammable gas.

REACTIVITY DATA

Materials To Avoid: Avoid contact with materials such as sulfides and sulfites which could release toxic gases, and be cautious in mixing with strong bases because high heat of reaction can generate steam.

Hazardous Decomposition Products: None.

Hazardous Polymerization: Does not occur.

HEALTH EFFECTS SUMMARY

The following information presents both human experience and the results of scientific experiments used by qualified experts to assess the effects of phosphoric acid on the health of industrially exposed individuals and to support the Precautionary Statements and Occupational Control Procedures recommended in this document. To avoid misunderstanding, the data provided in this section should be interpreted by individuals trained in evaluation of this type of information.

Human Experience

Dermal contact is expected to be the primary route of occupational exposure to phosphoric acid. Phosphoric acid is considered to be corrosive to the eyes and skin. Phosphoric acid may not produce an immediate burning sensation upon skin contact, delaying the awareness of the worker that contact has occurred. Occupational exposure to this material has not been reported to cause significant adverse health effects when recommended safety precautions are followed.

Toxicological Data

Data from Monsanto studies indicate the following:

	<u>Acute Oral LD₅₀ (Rat)</u>	<u>Acute Dermal LD₅₀ (Rabbit)</u>	<u>Eye Irritation FHSA 24-hr</u>	<u>Skin Irritation Rabbit</u>	<u>Skin Irritation 4-hr DOT Rabbit</u>
Phosphoric acid 75%	4,400 mg/kg, Slightly Toxic	Greater than 3,160 mg/kg, Slightly Toxic	Corrosive	Corrosive	Noncorrosive
Phosphoric acid 80%	4,200 mg/kg, Slightly Toxic	Greater than 3,160 mg/kg, Slightly Toxic	Corrosive	Corrosive	Noncorrosive
Phosphoric acid 85%	3,500 mg/kg, Slightly Toxic	Greater than 1,260 mg/kg, Slightly Toxic	Corrosive	Corrosive	Corrosive

The results of the acute oral and dermal tests indicate that these concentrations of phosphoric acid are slightly toxic by ingestion in single oral doses and by single dermal applications. Following a 24-hour exposure, irreversible eye and skin damage occurred at all tested concentrations of phosphoric acid.

Additional Information

Phosphoric acid has a low vapor pressure at room temperature and is not expected to present a significant inhalation hazard under ambient conditions. Phosphoric acid, however, can be irritating to the respiratory tract if inhaled as a mist or if the material is vaporized.

PHYSICAL DATA

Appearance and Odor: Clear, colorless, syrupy liquid; no foreign odor

Vapor Pressure @ 20°C (mm Hg): 0.0285 (100% acid)

Solubility in Water: Complete

	75%	80%	85%
Boiling Point (760 mm Hg):	135°C	144°C	154°C
Freezing Point:	-17.5°C	+4.6°C	+21.1°C
Viscosity @ 25°C (centistokes):	12	17	23
Specific Gravity @ 25°C/15.5°C:	1.575	1.633	1.692
% Equivalent H₃PO₄:	75.1	80.35	85.5
Lbs./gallon @ 25°C:	13.17	13.66	14.15

Note: These physical data are typical values based on material tested but may vary from sample to sample. Typical values should not be construed as a guaranteed analysis of any specific lot or as specification items.

SPILL, LEAK & DISPOSAL INFORMATION

Emergency Spill and

Leak Information: Contain spills and leaks to prevent discharge to the environment. Neutralize cautiously with a base such as soda ash.

Phosphoric acid, as currently defined, is a *hazardous substance* under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA). If 5,000 pounds or more are released into the environment, it must be reported to the National Response Center (800-424-8802 or 202-426-2675). Since local, state and federal laws may vary, consult your attorney or appropriate regulatory officials for information relating to spill reporting.

Keep product out of sewers, watersheds and water systems.

Disposal Information: Dispose of in accordance with all applicable federal, state and local regulations.

As currently defined in the federal Resource Conservation and Recovery Act (RCRA), unneutralized phosphoric acid, when discarded, is a *hazardous waste* exhibiting the characteristics of corrosivity (D-002). See 40 CFR 261.22. Its disposal, therefore, is regulated by federal RCRA regulations. Consult your attorney or appropriate regulatory officials for information regarding additional state and local waste disposal requirements.

ADDITIONAL COMMENTS

Store in rubber-lined or 316 stainless steel tanks designed for H₃PO₄. Store drums away from heat and out of direct sunlight.

Monsanto MATERIAL SAFETY DATA

Page 5 of 5

DATE: 10/1/85
MSDS NO.: 007664382

SUPERSEDES: 5/1/83

FOR ADDITIONAL NON-EMERGENCY INFORMATION, CONTACT:

Product Acceptability Coordinator
Detergent Materials
Monsanto Industrial Chemicals Co.
314-694-2096
(A Unit of Monsanto Company)

MATERIAL SAFETY DATA
Phosphoric Acid

Although the information and recommendations set forth herein (hereinafter "In-formation") are presented in good faith and believed to be correct as of the date hereof, Monsanto Company makes no representations as to the completeness or accuracy thereof. Information is supplied upon the condition that the persons receiving same will make their own determination as to its suitability for their purposes prior to use. In no event will Monsanto Company be responsible for damages of any nature whatsoever resulting from the use of or reliance upon Information. NO REPRESENTATIONS OR WARRANTIES, EITHER EXPRESS OR IMPLIED, OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR OF ANY OTHER NATURE ARE MADE HEREUNDER WITH RESPECT TO INFORMATION OR THE PRODUCT TO WHICH INFORMATION REFERS.



U.S. DEPARTMENT OF LABOR
WORKPLACE STANDARDS ADMINISTRATION

CERRO COPPER PRODUCTS COMPANY
MSDS NUMBER - CCPC-00-0000

PLASTAL Cool Tool

Box 810, 36 Draffin Road,
Hilton, N.Y. 14468

ENVIRONMENTAL: _____
HEALTH: _____
SAFETY: _____
REGULATORY: _____

ON

MANUFACTURER'S NAME

MONROE FLUID TECHNOLOGY, INC.

EMERGENCY TELEPHONE NO.
716-392-3434

ADDRESS (NUMBER, STREET, CITY, STATE AND ZIP CODE)

36 Draffin Road, Hilton, New York 14468

CHEMICAL NAME AND SYNONYMS

N/A

TRADE NAME AND SYNONYMS

COOL-TOOL

CHEMICAL FAMILY

N/A

FORMULA

Mixture

SECTION II: HAZARDOUS INGREDIENTS*

PAINTS, PRESERVATIVES/SOLVENTS	%	TLV (UNITS)	ALLOYS AND METALLIC COATINGS	%	TLV (UNITS)
PIGMENTS			BASE METAL		
CATALYST			ALLOYS		
VEHICLE			METALLIC COATINGS		
SOLVENTS			FILLER METAL PLUS		
1,1,1-trichloroethane*	33	350 ppm	COATING OR CORE FLUX		
ADDITIVES			OTHERS		
OTHERS					
* CAS NO. 71-55-6					

HAZARDOUS MIXTURES OF OTHER LIQUIDS, SOLIDS, OR GASES*

	%	TLV (UNITS)
Mineral Oil CAS NO. 64741-53-5	34	5mg/m ³
		Mist

SECTION III: PHYSICAL DATA

BOILING POINT (°F)	198	SPECIFIC GRAVITY (H ₂ O = 1)	1.035
VAPOR PRESSURE (mm Hg.) @ 20°C	92.7	PERCENT VOLATILE BY VOLUME (%)	35
VAPOR DENSITY (AIR = 1)	4.5	EVAPORATION RATE Butyl Acetate = 1	< 1
SOLUBILITY IN WATER	nil		

APPEARANCE AND ODOR

Golden oil with characteristic odor.

SECTION IV: FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (METHOD USED)	FLAMMABLE LIMITS	Let	Uel
COC greater than 350°F		not determined	

EXTINGUISHING MEDIA

Water fog, foam, dry chemical

SPECIAL FIRE FIGHTING PROCEDURES

Use usual procedures as with oil fire, may emit CO₂, CO, HCL

UNUSUAL FIRE AND EXPLOSION HAZARDS

Closed containers will pressurize at high temperature.

SECTION V: HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE

350 ppm: 500 ppm Max. for vapor. 5mg/m³ for oil mists.

EFFECTS OF OVEREXPOSURE

Anesthetic effects may occur in the range of 500 to 1000 ppm of vapor.

EMERGENCY AND FIRST AID PROCEDURES

Inhalation: Remove to fresh air, keep warm and quiet until recovery.

Skin and Eyes: Flush eyes with plenty of water. For skin and eyes: Get medical attention if irritation develops. Ingestion: Treat symptomatically; Low oral toxicity, stomach evacuation may be desired.

SECTION VI: REACTIVITY DATA

STABILITY	UNSTABLE	CONDITIONS TO AVOID
	STABLE	X Open flames, welding arcs can decompose vapors.

II. COMPATIBILITY (MATERIALS TO AVOID)

Strong oxidizing agents

HAZARDOUS DECOMPOSITION PRODUCTS Exposure to high temperatures or open flames generates hydrogen chloride and very small amounts of Phosgene and Chlorine.

HAZARDOUS POLYMERIZATION	MAY OCCUR	CONDITIONS TO AVOID
	WILL NOT OCCUR	X

SECTION VII: SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

1. wipe or soak up with absorbent material and bury in approved landfill.

WASTE DISPOSAL METHOD

Collect and dispose as waste oil in approved landfill or incinerate in approved facility.

SECTION VIII: SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION (SPECIFY TYPE)

Concentration above 2%-Use self-contained breathing apparatus.

VENTILATION	LOCAL EXHAUST	SPECIAL
	MECHANICAL (GENERAL)	None
	Provide ventilation to control TLV	

PROTECTIVE GLOVES

Neoprene to avoid prolonged contact

EYE PROTECTION

Safety glasses.

OTHER PROTECTIVE EQUIPMENT

None

SECTION IX: SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING

Handle with reasonable care. Avoid breathing vapors in concentrations over

100 ppm with a maximum peak of 500 ppm. Store in cool, dry place.

OTHER PRECAUTIONS

In misting, oil mist should be controlled. Do not weld or cut empty containers.

James L. [Signature]

10/85

DATE

ENVIRONMENTAL
SAFETY
PURCHASING

MANUFACTURER'S NAME Missouri Minerals Incorporates	CONTACT Edward L. Hanstein
ADDRESS (STREET, CITY, STATE AND ZIP CODE) High Hill, Missouri 63350	EMERGENCY TELEPHONE NO. (314) 585-2214
TRADE NAME, COMMON NAME OR SPECIFICATION Hawthorne Bond & Plastic Fireclay	APPROVED BY MC DATE 06/06/86
CHEMICAL FAMILY OR PRODUCT TYPE	

SECTION II COMPOSITION

CHEMICAL NAME	%	COMMON NAME	REG * (Y/N)	CAS #	OSHA PERMISSIVE EXPOSURE LIMIT	ACGIH TLV	CAN. OGE. (Y/N)
Silicon Oxide*	55	Silica	Y	1480-60-7	15mg/m ³	10 mg/m ³	N
					Total	Total	
Aluminum Oxide	40	Alumina	Y	1344-28-1	"	"	N
Titanium Dioxide	2	Titania	Y	13463-67-7	"	"	N
Silicon Oxide	7	Quartz	Y	14808-60-7		0.1 mg/m ³	N

*Most of Alumina and Silica is combined as aluminum silicate (Kaolinite)

*Regulated as per lists: OSHA 29CFR 1910, subpart Z; ACGIH, HHS/NTP; & IARC.

SECTION III PHYSICAL AND CHEMICAL DATA

BOILING POINT	N/A	MELTING POINT	3100°F	SPECIFIC GRAVITY	2.0
VAPOR PRESSURE	N/A	PERCENT VOLATILE BY VOL	N/A	VAPOR DENSITY	N/A
EVAPORATION RATE	N/A	SOLUBILITY IN WATER	Insoluble	SOLUBILITY IN ALCOHOL	Insoluble
SOLUBILITY IN OTHER SOLVENT		APPEARANCE AND ODOR			
N/A		Odorless granular material			

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT	None	(METHOD USED)	FLAMMABLE LIMITS	LEL	UEL
EXTINGUISHING MEDIA	N/A				
SPECIAL FIRE FIGHTING PROCEDURES	N/A				
EXPLOSION POTENTIAL	N/A				

SECTION V HEALTH, FIRST AID AND MEDICAL DATA

PRIMARY ROUTE(S) OF ENTRY	ACUTE AND CHRONIC HEALTH EFFECTS AND EFFECTS OF OVEREXPOSURE	FIRST AID AND MEDICAL INFORMATION
INHALATION	Short term - nuisance dust Very long term - could cause silicosis	Short term - remove to dust free area Long term - consult physician
INGESTION	None Known	N/A
SKIN CONTACT & ABSORPTION	Abrasive	Wash area
EYE	Abrasive	Treat as particle in eye
OTHER POTENTIAL HEALTH RISKS	NAIF	NAIF

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SECTION VI CORROSIVITY AND REACTIVITY DATA			
STABILITY	UNSTABLE <input type="checkbox"/>	STABLE <input checked="" type="checkbox"/>	POLYMERIZATION MAY OCCUR <input type="checkbox"/> WILL NOT OCCUR <input checked="" type="checkbox"/>
INCOMPATIBILITY (MATERIALS TO AVOID) Inert			
DECOMPOSITION PRODUCTS Inert			
CONDITIONS TO BE AVOIDED Keep Dry			

SECTION VII STORAGE, HANDLING AND USE PROCEDURES	
NORMAL STORAGE AND HANDLING	Keep Dry
NORMAL USE	Avoid breathing of dust
STEPS TO BE TAKEN IN CASE OF LEAKS OR SPILLS	Follow normal housekeeping procedures
WASTE DISPOSAL METHOD	Remove to approved land fill or dump

SECTION VIII PERSONAL PROTECTION INFORMATION	
RESPIRATORY PROTECTION (SPECIFY TYPE)	Nuisance dust respirator
VENTILATION	LOCAL Recommended
	MECHANICAL (GENERAL) Recommended
	OTHER N/A
PROTECTIVE GLOVES	Recommended
EYE PROTECTION	Recommended
OTHER EQUIPMENT	N/A
MEASURES TO BE TAKEN DURING REPAIR AND MAINTENANCE OF CONTAMINATED EQUIPMENT THAT HAS BEEN IN CONTACT WITH THIS MATERIAL No special precautions	

SECTION IX SPECIAL PRECAUTIONS	
PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE	Avoid breathing of dust
OTHER PRECAUTIONS	None

**NAIF = NO APPLICABLE INFORMATION FOUND

***N/A NOT APPLICABLE

①
BETZ INDUSTRIAL
4636 SOMERTON ROAD, TREVOSE, PA. 19047
BETZ MATERIAL SAFETY DATA SHEET
24 HOUR EMERGENCY TELEPHONE (HEALTH OR ACCIDENT) 215/355-3300

PRODUCT : POLYMER 3315L ②

EFFECTIVE DATE 10-31-88
PRINTED: 12/17/88

PRODUCT APPLICATION : FLOCCULANT

-----SECTION 1-----HAZARDOUS INGREDIENTS-----

INFORMATION ON PHYSICAL HAZARDS, HEALTH HAZARDS, PEL'S AND TLV'S FOR SPECIFIC PRODUCT INGREDIENTS AS REQUIRED BY THE OSHA HAZARD COMMUNICATIONS STANDARD ARE LISTED. REFER TO SECTION 4 (PAGE 2) FOR OUR ASSESSMENT OF THE POTENTIAL ACUTE AND CHRONIC HAZARDS OF THIS FORMULATION.

PETROLEUM DISTILLATES***(NAPHTHA);CAS#8002-05-9;POTENTIAL EYE,SKIN AND INHALATION IRRITANT;COMBUSTIBLE LIQUID;PEL:500 PPM;TLV:NONE.

-----SECTION 2-----TYPICAL PHYSICAL DATA-----

PH: 5% SOL. (APPROX.)	5.0	ODOR: HYDROCARBON
FL.PT.(DEG.F):	200 SETA(CC)	SP.GR.(70F)OR DENSITY: 1.008
VAPOR PRESSURE(mmHG):	NA	VAPOR DENSITY(AIR=1): NA
VISC cps70F: (1% SOLN)	225	%SOLUBILITY(WATER): 5
EVAP.RATE: 1 ETHER=1		APPEARANCE: WHITE
PHYSICAL STATE: EMULSION		FREEZE POINT(DEG.F): 24

-----SECTION 3-----REACTIVITY DATA-----

STABLE

THERMAL DECOMPOSITION (DESTRUCTIVE FIRES) YIELDS ELEMENTAL OXIDES.

MATERIAL SAFETY DATA SHEET (PAGE 2 OF 3)

PRODUCT: POLYMER 3315L

EFFECTIVE DATE 10-31-88

-----SECTION 4-----HEALTH HAZARD EFFECTS-----

ACUTE SKIN EFFECTS *** PRIMARY ROUTE OF EXPOSURE

MODERATELY IRRITATING TO THE SKIN

ACUTE EYE EFFECTS ***

SEVERE IRRITANT TO THE EYES

ACUTE RESPIRATORY EFFECTS *** PRIMARY ROUTE OF EXPOSURE

VAPORS, GASES, MISTS OR AEROSOLS MAY CAUSE IRRITATION TO UPPER RESPIRATORY TRACT. PROLONGED EXPOSURE MAY CAUSE DIZZINESS AND HEADACHE.

CHRONIC EFFECTS OF OVEREXPOSURE***

NO EVIDENCE OF POTENTIAL CHRONIC EFFECTS.

MEDICAL CONDITIONS AGGRAVATED ***

NOT KNOWN

SYMPTOMS OF EXPOSURE ***

EXCESSIVE SKIN CONTACT MAY CAUSE DEFATTING OR DRYING OF SKIN; EXCESSIVE INHALATION OF VAPORS MAY CAUSE DIZZINESS, HEADACHE AND NAUSEA.

-----SECTION 5-----FIRST AID INSTRUCTIONS-----

SKIN CONTACT***

REMOVE CONTAMINATED CLOTHING. WASH EXPOSED AREA WITH A LARGE QUANTITY OF SOAP SOLUTION OR WATER FOR 15 MINUTES

EYE CONTACT***

IMMEDIATELY FLUSH EYES WITH WATER FOR 15 MINUTES. IMMEDIATELY CONTACT A PHYSICIAN FOR ADDITIONAL TREATMENT

INHALATION EXPOSURE***

REMOVE VICTIM FROM CONTAMINATED AREA TO FRESH AIR. APPLY APPROPRIATE FIRST AID TREATMENT AS NECESSARY

INGESTION***

DO NOT FEED ANYTHING BY MOUTH TO AN UNCONSCIOUS OR CONVULSIVE VICTIM
DO NOT INDUCE VOMITING. IMMEDIATELY CONTACT PHYSICIAN. DILUTE CONTENTS OF STOMACH USING 3-4 GLASSES MILK OR WATER

-----SECTION 6-----SPILL, DISPOSAL AND FIRE INSTRUCTIONS-----

SPILL INSTRUCTIONS***

VENTILATE AREA, USE SPECIFIED PROTECTIVE EQUIPMENT. CONTAIN AND ABSORB ON ABSORBENT MATERIAL. PLACE IN WASTE DISPOSAL CONTAINER. THE WASTE CHARACTERISTICS OF THE ABSORBED MATERIAL, OR ANY CONTAMINATED SOIL, SHOULD BE DETERMINED IN ACCORDANCE WITH RCRA REGULATIONS.
FLUSH AREA WITH WATER. WET AREA MAY BE SLIPPERY. IF SO, SPREAD SAND/GRIT.

DISPOSAL INSTRUCTIONS***

WATER CONTAMINATED WITH THIS PRODUCT MAY BE SENT TO A SANITARY SEWER TREATMENT FACILITY, IN ACCORDANCE WITH ANY LOCAL AGREEMENT, A PERMITTED WASTE TREATMENT FACILITY OR DISCHARGED UNDER A NPDES PERMIT PRODUCT (AS IS)-

INCINERATE OR BURY IN APPROVED LANDFILL

FIRE EXTINGUISHING INSTRUCTIONS***

FIREFIGHTERS SHOULD WEAR POSITIVE PRESSURE SELF-CONTAINED BREATHING APPARATUS (FULL FACE-PIECE TYPE).

DRY CHEMICAL, CARBON DIOXIDE, FOAM OR WATER. FOAM OR WATER CREATE A SLIPPERY CONDITION. SPREAD SAND OR GRIT

MATERIAL SAFETY DATA SHEET (PAGE 3 OF 3)

PRODUCT: POLYMER 3315L

EFFECTIVE DATE 10-31-88

-----SECTION 7-----SPECIAL PROTECTIVE EQUIPMENT-----
USE PROTECTIVE EQUIPMENT IN ACCORDANCE WITH 29CFR SECTION 1910.132-134. USE
RESPIRATORS WITHIN USE LIMITATIONS OR ELSE USE SUPPLIED AIR RESPIRATORS.
VENTILATION PROTECTION***
ADEQUATE VENTILATION TO MAINTAIN AIR CONTAMINANTS BELOW EXPOSURE LIMITS
RECOMMENDED RESPIRATORY PROTECTION***
IF VENTILATION IS INADEQUATE OR SIGNIFICANT PRODUCT EXPOSURE IS LIKELY,
USE A RESPIRATOR WITH ORGANIC VAPOR CARTRIDGES.
RECOMMENDED SKIN PROTECTION***
NEOPRENE GLOVES
WASH OFF AFTER EACH USE.REPLACE AS NECESSARY
RECOMMENDED EYE PROTECTION***
SPLASH PROOF CHEMICAL GOGGLES

-----SECTION 8-----STORAGE AND HANDLING PRECAUTIONS-----
STORAGE INSTRUCTIONS***
KEEP DRUMS & PAILS CLOSED WHEN NOT IN USE.
PROTECT FROM FREEZING
HANDLING INSTRUCTIONS***
IMMEDIATELY REMOVE CONTAMINATED CLOTHING,WASH BEFORE REUSE
NORMAL CHEMICAL HANDLING

THIS MSDS COMPLIES WITH THE OSHA HAZARD COMMUNICATION STANDARD
HAROLD M. HERSH (ENVIROMENTAL INFORMATION COORDINATOR)

APPENDIX: REGULATORY INFORMATION
THE CONTENT OF THIS APPENDIX REPRESENTS INFORMATION KNOWN TO BETZ ON THE
EFFECTIVE DATE OF THIS MSDS. THIS INFORMATION IS BELIEVED TO BE ACCURATE.
ANY CHANGES IN REGULATIONS WILL RESULT IN UPDATED VERSIONS OF THIS DOCUMENT.

...TSCA: ALL COMPONENTS OF THIS PRODUCT ARE LISTED IN THE TSCA INVENTORY
...REPORTABLE QUANTITY(RQ) FOR UNDILUTED PRODUCT:
TREAT AS OIL SPILL
...RCRA: IF THIS PRODUCT IS DISCARDED AS A WASTE,THE RCRA HAZARDOUS WASTE
IDENTIFICATION NUMBER IS: NOT APPLICABLE
...DOT HAZARD CLASSIFICATION: NOT APPLICABLE
...DOT SHIPPING DESIGNATION IS: NOT APPLICABLE

...THIS PRODUCT CONTAINS THESE CHEMICALS KNOWN TO THE STATE OF CALIFORNIA TO
CAUSE CANCER OR REPRODUCTIVE TOXICITY: NONE PRESENT IN SIGNIFICANT AMOUNTS
...SARA SECTION 302 CHEMICALS: NONE PRESENT IN SIGNIFICANT AMOUNTS
...SARA SECTION 313 CHEMICALS: NONE PRESENT IN SIGNIFICANT AMOUNTS
...SARA SECTION 312 HAZARD CLASS: IMMEDIATE(ACUTE)
...MICHIGAN CRITICAL MATERIALS: NONE PRESENT IN SIGNIFICANT AMOUNTS
NFPA/HMIS : HEALTH - 2 ; FIRE - 1 ; REACTIVITY - 0 ; SPECIAL - NONE ; PE - B

-TYPE 1-

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U.S. DEPARTMENT OF LABOR
Occupational Safety and Health Administration

Form Approved
OMB No. 44-R1367

PORTLAND Cement

MATERIAL SAFETY DATA SHEET

CERRO COPPER PRODUCTS COMPANY
MSDS NUMBER - CCEP-000000

Requ.

pairing.

(revised October 11, 1981)

MANUFACTURER'S NAME Continental Cement Company		EMERGENCY TELEPHONE NO. 314-221-1740
ADDRESS (Number, Street, City, State, and ZIP Code) P. O. Box 71, Hannibal, MO 63401		
CHEMICAL NAME AND SYNONYMS Portland Cement (CAS#65997-15-1)		TRADE NAME AND SYNONYMS Continental Cement
CHEMICAL FAMILY Calcium Salts	FORMULA (3 CaO·SiO ₂) (2 CaO·SiO ₂) (CaSO ₄ ·H ₂ O) (3 CaO·Al ₂ O ₃) (4 CaO·Al ₂ O ₃ ·Fe ₂ O ₃)	

SECTION II - HAZARDOUS INGREDIENTS

PAINTS, PRESERVATIVES, & SOLVENTS	%	TLV (Units)	ALLOYS AND METALLIC COATINGS	%	TLV (Units)
PIGMENTS N/A			BASE METAL N/A		
CATALYST N/A			ALLOYS N/A		
VEHICLE N/A			METALLIC COATINGS N/A		
SOLVENTS N/A			FILLER METAL PLUS COATING OR CORE FLUX N/A		
ADDITIVES N/A			OTHERS N/A		
OTHERS N/A			N/A		
HAZARDOUS MIXTURES OF OTHER LIQUIDS, SOLIDS, OR GASES				%	TLV (Units)
No known hazardous ingredients. Portland Cements are classified by OSHA (29 CFR 1910.1000 Table Z-3) MSHA (30CFR 55.5-1, Ref. 2, ACGIH TLV's for 1973 Appendix E), and ACGIH (TLV's for 1985-6, Appendix D) as nuisance dusts. They are neither hazardous nor toxic. Portland cements are NOT listed by NTP, IARC, or OSHA as containing carcinogens.					

SECTION III - PHYSICAL DATA

BOILING POINT (°F.)	N/A	SPECIFIC GRAVITY (H ₂ O=1)	3.0 - 3.2
VAPOR PRESSURE (mm Hg.)	N/A	PERCENT VOLATILE BY VOLUME (%)	N/A
VAPOR DENSITY (AIR=1)	N/A	EVAPORATION RATE (_____ =1)	N/A
SOLUBILITY IN WATER	Slight	0.1 - 1.0%	
APPEARANCE AND ODOR	Gray Powder - No odor		

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (Method used) Noncombustible or explosive	FLAMMABLE LIMITS N/A	Let	Uet
EXTINGUISHING MEDIA N/A			
SPECIAL FIRE FIGHTING PROCEDURES N/A			
UNUSUAL FIRE AND EXPLOSION HAZARDS None			

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SECTION V - HEALTH HAZARD DATA	
THRESHOLD LIMIT VALUE Respirable Dust-5mg/m ³ Total Dust-10mg/m ³ Particles/ft ³ -30 million	
EFFECTS OF OVEREXPOSURE Acute: Wet cement, especially as an ingredient in plastic (unhardened) concrete, mortar, or slurries can dry the skin and cause alkali burns. Cement dust can irritate the eyes and respiratory system. Chronic: Cement dust can cause inflammation of the lining tissue of the interior of the nose and inflammation of the cornea. Hypersensitive individuals may develop an allergic dermatitis.	
EMERGENCY AND FIRST AID PROCEDURES Irrigate eyes immediately and repeatedly with water and get prompt medical attention. Wash exposed skin areas with soap and water.	

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SECTION VI - REACTIVITY DATA			
STABILITY	UNSTABLE		CONDITIONS TO AVOID
	STABLE	X	Keep dry until used
INCOMPATIBILITY (Reactions to avoid) None			
HAZARDOUS DECOMPOSITION PRODUCTS None			
HAZARDOUS POLYMERIZATION	MAY OCCUR		CONDITIONS TO AVOID
	WILL NOT OCCUR	X	

SECTION VII - SPILL OR LEAK PROCEDURES	
STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED Use dry cleanup methods that do not disperse the dust into the air. Avoid breathing the dust. Emergency procedures are not required.	
WASTE DISPOSAL METHOD Material can be disposed of as common waste or returned to the container for later use if it is not contaminated.	

SECTION VIII - SPECIAL PROTECTION INFORMATION		
RESPIRATORY PROTECTION (Specify type) In dusty environments, the use of NIOSH approved dust filter type respirator is recommended.		
VENTILATION	LOCAL EXHAUST Sufficient to avoid exceeding threshold limit value	SPECIAL
	MECHANICAL (General)	OTHER
PROTECTIVE GLOVES Yes		EYE PROTECTION Safety Glasses.
OTHER PROTECTIVE EQUIPMENT Protective clothing where exposure is heavy and prolonged.		

SECTION IX - SPECIAL PRECAUTIONS	
PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING May cause a severe skin irritation and burns on individuals with sensitive skin.	
Avoid skin and eye contact - Rinse exposed areas immediately and repeatedly with water and get prompt medical attention.	
OTHER PRECAUTIONS	

* eyes and upper respiratory system.
Chronic: Cement dust can cause inflammation of the lining tissue of the interior of the nose and inflammation of the cornea. Hypersensitive individuals may develop an allergic dermatitis.

Propane
Date October, 1985

MATERIAL SAFETY DATA SHEET

Page 1 of 6

Product Name:

PROPANE

PHILLIPS PETROLEUM COMPANY
Bartlesville, Oklahoma 74004

Emergency Phone Nos.

918-661-3865 (during business)

981-661-8118 (after hours)



USA AND CANADA



WORLDWIDE

OTHER COUNTRIES

PRODUCT IDENTIFICATION

Synonyms: Dimethylmethane

Chemical Name: Propane

Chemical Family: Paraffinic Hydrocarbon

Chemical Formula: C_3H_8

CAS Reg. No: 74-98-6

Product No: NE

Product and/or Components Entered on EPA's TSCA Inventory: Yes ☒ No ☐

HAZARDOUS COMPONENTS

Ingredients	CAS Number	% By Wt.	OSHA PEL	ACGIH TLV
Propane	74-98-6	>90	1000 ppm	Simple Asphyxiant
Propylene	115-07-1	<5	NE	Simple Asphyxiant
n-Butane	106-97-8	<2.5	NE	800 ppm

*See Additional Comments (Page 6) for exact compositions.

PERSONAL PROTECTION INFORMATION

Ventilation: Use adequate ventilation to control exposure below recommended levels.

Respiratory Protection: Not generally required. When entry into or exit from concentrations of unknown exposure, use NIOSH/MSHA approved self-contained breathing apparatus (SCBA).

Eye Protection: Use safety glasses with side shields.

Skin Protection: No special garments required. Avoid unnecessary skin contamination with material.

NOTE: Personal protection information shown above is based upon general information as to normal uses and conditions. Where special or unusual uses or conditions exist, it is suggested that the expert assistance of an industrial hygienist or other qualified professional be sought.

HANDLING AND STORAGE PRECAUTIONS

Avoid inhalation and skin and eye contact. Wear protective equipment and/or garments described above if exposure conditions warrant. Wash hands after handling.

Store in a cool, well ventilated area away from ignition sources. Provide means for controlling leaks. Bond and ground during transfer. Keep containers closed.

REACTIVITY DATA

Stability: Stable ☒ Unstable ☐ Conditions to Avoid:

Incompatibility (Materials to Avoid): Oxygen and strong oxidizing agents.

Hazardous Polymerization: Will Not Occur ☒ May Occur ☐ Conditions to Avoid

Hazardous Decomposition Products: Carbon oxides formed when burned.

HEALTH HAZARD DATA

RECOMMENDED EXPOSURE LIMITS: OSHA PEL 1000 ppm (propane).
ACGIH simple asphyxiant (propane)

ACCUTE EFFECTS OF OVEREXPOSURE:

EYE: Very high gas concentrations may cause mild irritation effects. Liquefied gas may cause freeze-burns upon direct contact.

SKIN: Very high gas concentrations may cause mild irritation to mucous membranes. Liquefied gas may cause freeze-burns upon direct contact.

INHALATION: Simple asphyxiant. Extreme over exposure may produce dizziness, headache, disorientation, excitation, fatigue, inability to concentrate, vomiting, coughing, anesthesia, unconsciousness and death.

INGESTION: Not a likely exposure route. Liquefied gas may cause freeze-burns to the mucous membranes and possible central nervous system depression.

SUBCHRONIC AND CHRONIC EFFECTS OF OVEREXPOSURE:

Exposure to 1000 ppm for 8 hours a day, 5 days a week, for approximately 2 weeks produced no abnormal reactions, including cardiac, pulmonary, and neurologic functions in humans.

OTHER HEALTH EFFECTS:

Propane was not mutagenic in the AMES assay.

HEALTH HAZARD CATEGORIES:

	Animal	Human		Animal	Human
Known Carciogen	<input type="checkbox"/>	<input type="checkbox"/>	Toxic	<input type="checkbox"/>	<input type="checkbox"/>
Suspect Carcinogen	<input type="checkbox"/>	<input type="checkbox"/>	Corrosive	<input type="checkbox"/>	<input type="checkbox"/>
Mutagen	<input type="checkbox"/>	<input type="checkbox"/>	Irritant	<input type="checkbox"/>	<input type="checkbox"/>
Teratogen	<input type="checkbox"/>	<input type="checkbox"/>	Target Organ Toxin	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Allergic Sensitizer	<input type="checkbox"/>	<input type="checkbox"/>	Specify	Eye and skin	
Highly Toxic	<input type="checkbox"/>	<input type="checkbox"/>		freeze-burns	

FIRST AID AND EMERGENCY PROCEDURES:

EYE: Immediately flush eyes with running water for at least 15 minutes. If irritation develops, seek medical attention.

SKIN: Flush skin with water for 15 minutes. If irritation develops, seek medical attention.

INHALATION: Remove from exposure. If breathing ceases, administer artificial respiration followed by oxygen. Seek medical attention.

INGESTION: Seek immediate medical attention.

ADDITIONAL COMMENTS

Phillips believes that the information contained herein (including data and statements) is accurate as of the date hereof. NO WARRANTY OR MERCHANTABILITY, FITNESS FOR ANY PARTICULAR PURPOSE, OR ANY OTHER WARRANTY, EXPRESS OR IMPLIED, IS MADE AS CONCERNS THE INFORMATION HEREIN PROVIDED. The information provided herein relates only to the specific product designated and may not be valid where such product is used in combination with any other materials or in any process. Further, since the conditions and methods of use of the product and the information referred to herein are beyond the control of Phillips (references to Phillips including its divisions, affiliates, and subsidiaries), Phillips expressly disclaims any and all liability as to any results obtained or arising from any use of the product or such information. No statement made herein shall be construed as a permission or recommendation for the use of any product in a manner that might infringe existing patents.

MATERIAL SAFETY DATA SHEET

Page 4 of 6

PHYSICAL DATA

Appearance: Colorless liquefied petroleum gas

Odor: Repulsive

Boiling Point: -44°F (-42°C)

Vapor Pressure: 208 psig at 100°F

Vapor Density (Air = 1): 1.5

Solubility in Water: Negligible

Specific Gravity (H₂O = 1): 0.508-0.510 at 60/60°F

Percent Volatile by Volume: 100

Evaporation Rate (____ Ethyl Ether ____ = 1): >1

Viscosity: NE

FIRE and EXPLOSION DATA

Flash Point (Method Used): -156°F (-104°C) (Estimated)

Flammable Limits (% By Volume in Air): LEL 2.1 UEL 9.5

Fire Extinguishing Media: Dry chemical, foam or carbon dioxide (CO₂).

Special Fire Fighting: Evacuate area of all unnecessary personnel. Use NIOSH/MSHA approved self-contained breathing apparatus and other protective equipment and/or garments described on Page 2 if conditions warrant. Shut off source, if possible. Water fog or spray may be used to cool exposed containers and equipment. Allow fire to burn until gas flow is shut off, if possible.

Fire and Explosion Hazards: Carbon oxides formed when burned. Highly flammable vapors which are heavier than air may accumulate in low areas and/or spread along ground away from handling site.

SPILL, LEAK and DISPOSAL PROCEDURES

Precautions Required if Material is Released or Spilled: Evacuate area of all unnecessary personnel. Wear protective equipment and/or garments described on Page 2 if exposure conditions warrant. Shut off source, if possible. Protect from ignition. Ventilate area thoroughly.

Waste Disposal (Insure Conformity with All Applicable Disposal Regulations): Incinerate or otherwise manage at RCRA permitted waste management facility.

MATERIAL SAFETY DATA SHEET

Page 5 of 6

DOT TRANSPORTATION

Shipping Name: Liquefied Petroleum Gas

Hazard Class: Flammable Gas

ID Number: UN 1075

Marking: Liquefied Petroleum Gas/UN 1075

Label: Flammable Gas

Placard: Flammable Gas/1075

Hazardous Substance/RQ: NA

Shipping Description: Liquefied Petroleum Gas, Flammable Gas, UN 1075

Packaging References: 49 CFR 173.304, 173.306, 173.314, and 173.315

RCRA CLASSIFICATION (FOR UNALDERATED PRODUCT AS A WASTE)

Ignitable

PROTECTIVE MEASURES DURING REPAIR AND MAINTENANCE OF CONTAMINATED EQUIPMENT

Wear protective equipment and/or garments described on Page 2 if exposure conditions warrant. Contact immediate supervisor for specific instructions before work is initiated.

HAZARD CLASSIFICATION

THIS PRODUCT MEETS THE FOLLOWING HAZARD DEFINITION(S) AS DEFINED BY OCCUPATIONAL SAFETY AND HEALTH REGULATIONS (29 CFR PART 1910.1200):

- | | | |
|---|--|---|
| <input type="checkbox"/> Not Hazardous | <input type="checkbox"/> Flammable Solid | <input type="checkbox"/> Oxidizer |
| <input type="checkbox"/> Combustible Liquid | <input type="checkbox"/> Flammable Aerosol | <input type="checkbox"/> Pyrophoric |
| <input type="checkbox"/> Compressed Gas | <input type="checkbox"/> Explosive | <input type="checkbox"/> Unstable |
| <input checked="" type="checkbox"/> Flammable Gas | <input checked="" type="checkbox"/> Health Hazard (See Page 3) | <input type="checkbox"/> Water Reactive |
| <input type="checkbox"/> Flammable Liquid | <input type="checkbox"/> Organic Peroxide | |

**NATIONAL
REFRACTORIE
MINERALS
CORPORATION**

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CERRO COPPER PRODUCTS COMPANY
MSDS NUMBER - CORD-20-0200
APPROVALS:
ENVIRONMENTAL _____
SAFETY _____

PURCHASE ORDER

**MATERIAL SAFETY
DATA SHEET**

Company / Plant National Refractories & Minerals Corp. One Kaiser Plaza, Suite 650 Oakland, California 94612	Issue Date Revised August 7, 1985	Identification Number NA
Trade Name (Common Name or Synonym) Purotab (all)	Emergency Phone Number (415) 462-1147	
Chemical Name NA	Formula NA	DOT Identification Number NA

I. INGREDIENTS

Material or Component Calcium aluminate cement (CAS # 65997-16-2) present in this product is less alkaline than Portland Cement. Other ingredients in this product have a toxicity no greater than currently listed for nuisance dusts. See Section V. 1984-85 ACGIH TLV's : 5 mg/m ³ respirable dust, 10 mg/m ³ total dust. OSHA 1910.1000 PEL's : 5 mg/m ³ respirable dust, 15 mg/m ³ total dust.
--

II. PHYSICAL DATA

Material is (At Normal Conditions): <input type="checkbox"/> Liquid <input type="checkbox"/> Solid <input type="checkbox"/> Gas <input checked="" type="checkbox"/> Other Granular, dry		Appearance and Odor Size: -1/4" Color: Grey Odor: None	
Acidity/Alkalinity pH = NA	Melting Point NA °F Boiling Point NA °F	Specific Gravity (H ₂ O = 1) 2.6-3.0 Solubility in water (% by weight) Nil	Vapor Pressure (mm Hg at 20°C) NA

III. PERSONAL PROTECTIVE EQUIPMENT

Respiratory Protection Respirator for particulates approved by NIOSH/MSHA and adequate for contaminant concentrations encountered.	Hands, Arms, and Body Gloves are recommended
Eyes and Face Safety glasses are recommended.	Other Clothing and Equipment NA

IV. EMERGENCY MEDICAL PROCEDURES

<ol style="list-style-type: none"> 1. Skin: Wash with soap and water. 2. Eyes: Irrigate immediately with plenty of water. Obtain medical attention if necessary.
--

V. HEALTH/SAFETY INFORMATION

Health	Inhalation	Nuisance dusts have little adverse effect on lungs and do not produce significant disease or toxic effect when exposures are kept under the TLV or PEL.		
	Ingestion	NA		
Health	Skin	May cause skin irritation on prolonged or repeated contact.		
	Eyes	May irritate or injure eyes.		
Threshold Limit Value See Section I				
Fire and Explosion	Flash Point	NA °F	Auto Ignition Temperature	Flammable Limits in Air
	<input checked="" type="checkbox"/> Not Flammable	NA °F	Lower NA %	Upper NA %
Fire and Explosion	Unusual Fire and Explosion Hazards			Extinguishing Media
	NA			NA
Reactivity	Stability	Incompatibility (Materials to Avoid)		
	<input checked="" type="checkbox"/> Stable <input type="checkbox"/> Unstable	NA		
Reactivity	Conditions to Avoid			
	NA			
Reactivity	Hazardous Decomposition Products			
	NA			

VI. ENVIRONMENTAL

Spill or leak procedures

We recommend that the purchaser establish a spill prevention, control and counter measure plan. This plan should include procedures for proper storage as well as clean-up of spills or leaks. The procedures should conform to safe practices and provide for proper recovery or disposal. Depending on the quantity spilled, notification of the National Response Center (800-424-8802) may be required in case of hazardous substances. (See EPA and DOT regulations; also various state and local regulations.)

Waste Disposal Method*

Used or unused product should be tested to determine hazard status and disposal requirements under federal, State or local laws and regulations.

*Disposer must comply with Federal, State and Local disposal or discharge laws.

VII. ADDITIONAL INFORMATION

1. Do not breathe dust.
2. Toxic risk may be altered by chemical or physical changes caused by conditions of use.
3. Purolab is a refractory castable.

The information in this MSDS was obtained from sources which we believe are reliable. However, the information is provided without any representation or warranty, express or implied, regarding the accuracy or correctness.

The conditions or methods of handling, storage, use and disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of the product.

MONSANTO PRODUCT NAME
PYDRAUL® 29E
FIRE RESISTANT HYDRAULIC FLUID

MONSANTO COMPANY
800 N. LINDBERGH BLVD.
ST. LOUIS, MO 63167

Emergency Phone No.
(Call Collect)
314-694-1000

PRODUCT IDENTIFICATION

PYDRAUL® 29E fire resistant hydraulic fluid is a proprietary product and has no CAS number. Its composition is a trade secret of Monsanto Company. All components of PYDRAUL 29E appear on the Inventory of Chemical Substances published by the U.S. Environmental Protection Agency under the authority of the Toxic Substance Control Act (TSCA).

Chemical Family:

Phosphate esters with performance additives.

Synonym(s):

Mixture of

2-Ethylhexyldiphenyl phosphate ester blend containing:

2-ethylhexyldiphenyl phosphate (CAS Reg. No. 1241-94-7)

di-2-ethylhexylphenyl phosphate (CAS Reg. No. 16368-97-1)

triphenyl phosphate (CAS Reg. No. 115-86-6);

p-t-Butylphenyl diphenyl phosphate ester blend containing:

p-t-butylphenyl diphenyl phosphate (CAS Reg. No. 56803-37-3)

triphenyl phosphate (CAS Reg. No. 115-86-6);

Di(C₇₋₉₋₁₁-alkyl)phthalate blend;

and performance additives.

DOT Hazard Class:

This product is not classified as a hazardous material by the U.S. Department of Transportation.

Label Requirements:

Product label

**Reportable Quantity (RQ)
Under U.S. EPA CERCLA
Regulations:**

Not listed.

**U.S. Surface Freight
Classification:**

Hydraulic system fluid, other than petroleum.

**Hazardous Chemical(s)
Under OSHA Hazard
Communication Standard:**

This product contains, as components, the substances listed below which are identified as hazardous chemicals under the criteria of the OSHA Hazard Communication Standard (29 CFR 1910.1200):

2-Ethylhexyldiphenyl Phosphate Ester Blend,
CAS Reg. No. Not Available

Triphenyl Phosphate, CAS Reg. No. 115-86-6

WARNING STATEMENTS

CAUTION!

MAY CAUSE IRRITATION TO EYES AND SKIN

ELEVATED PROCESSING TEMPERATURES MAY CAUSE RELEASE OF TOXIC VAPORS WHICH ARE HARMFUL IF INHALED

PRECAUTIONARY MEASURES

Avoid contact with eyes, skin, and clothing.
 Avoid breathing vapors.
 Keep container closed.
 Use only with adequate ventilation.
 Wash thoroughly after handling.

Note: This product may be toxic to fish. It should not be dumped, spilled, rinsed or washed into sewers or public waterways.

Dispose of containers in a secure landfill. Emptied container retains vapor and product residue. Observe all labeled safeguards until container is destroyed. **DO NOT REUSE THIS CONTAINER.**

EMERGENCY AND FIRST AID PROCEDURES

FIRST AID: IF IN EYES, immediately flush with plenty of water. Call a physician if irritation persists.

IF ON SKIN, immediately flush with plenty of water. Wash clothing before reuse.

IF INHALED, remove to fresh air. If not breathing, give artificial respiration, preferably mouth-to-mouth. If breathing is difficult, give oxygen. Call a physician.

OCCUPATIONAL CONTROL PROCEDURES

Eye Protection: PYDRAUL 29E fire resistant hydraulic fluid does *not* present significant eye irritation or eye toxicity requiring special protection. Avoid eye contact as good industrial practice.

Skin Protection: Wear appropriate protective gloves that provide a barrier and protective clothing to prevent skin contact. Consult glove manufacturer to determine appropriate type glove for given application. Wear a face shield and an apron that provides a barrier when splashing is likely. Wash contaminated skin promptly. Launder contaminated clothing and clean protective equipment before reuse. Wash thoroughly after handling.

Respiratory Protection: Avoid breathing vapor or mist. Use NIOSH/MSHA approved equipment when airborne exposure limits are exceeded. Consult respirator manufacturer to determine appropriate type equipment for given application. The respirator use limitations specified by NIOSH/MSHA or the manufacturer must be observed. High airborne concentrations may require use of self-contained breathing apparatus or supplied air respirator. Respiratory protection programs must be in compliance with 29 CFR 1910.134.

Ventilation: Provide ventilation to control exposure levels below airborne exposure limits. Use local mechanical exhaust ventilation at sources of air contamination such as open process equipment.

Airborne Exposure Limits: Product: PYDRAUL 29E Fire Resistant Hydraulic Fluid

OSHA PEL: None Established
 ACGIH TLV†: None Established

2-Ethylhexyldiphenyl Phosphate

OSHA PEL: None Established
 ACGIH TLV: None Established

(Health Effects Summary Continued On The Next Page)

HEALTH EFFECTS SUMMARY (Continued)

Airborne

Exposure Limits (Continued):

Di(C_{7,9,11}-alkyl) phthalate blend

Although OSHA and ACGIH have not established specific exposure limits for this material, they have established limits for several dialkyl phthalate esters:

For dimethyl-, dibutyl-, and di-2-ethylhexyl-phthalates:

OSHA PEL: 5 mg/m³ 8-hour time-weighted average

For dimethyl-, diethyl-, dibutyl- and di-2-ethylhexyl-phthalates:

ACGIH TLV: 5 mg/m³ 8-hour time-weighted average
10 mg/m³ short-term exposure limit

Monsanto has adopted a general guideline that exposure to phthalate esters should be kept below 5 mg/m³ 8-hour time-weighted average.

p-t-Butylphenyl diphenyl phosphate ester blend

OSHA PEL: None Established
ACGIH TLV: None Established

Triphenyl Phosphate

OSHA PEL: 3 mg/m³ 8-hour time-weighted average
ACGIH TLV: 3 mg/m³ 8-hour time-weighted average
ACGIH TLV: 6 mg/m³ short-term exposure limit

FIRE PROTECTION INFORMATION

Flash Point: 455°F **Method:** Cleveland Open Cup

Auto Ignition Temperature: 900°F **Method:** ASTM D-2155

Extinguishing Media: Water spray, foam, dry chemical, carbon dioxide or any Class B extinguishing agent.

Special Firefighting Procedures: Firefighters or others exposed to products of combustion should wear full protective clothing including self-contained breathing apparatus. Equipment should be thoroughly decontaminated after use.

Unusual Fire and Explosion Hazards: Products of decomposition include hazardous carbon monoxide, carbon dioxide, and oxides of phosphorus.

REACTIVITY DATA

Stability: Maximum bulk temperature in continuous use should be limited to 175°F (79°C). Higher temperature will cause increasing decomposition, especially when air and moisture are present. Decomposition is not expected to be sudden or violent.

Materials to Avoid: Exposure to materials which are highly oxidizing should be avoided.

Hazardous Decomposition Products: Oxides of phosphorus, carbon dioxide (CO₂), carbon monoxide (CO), smoke, soot, and low molecular weight hydrocarbons.

Hazardous Polymerization: Does not occur.

HEALTH EFFECTS SUMMARY

The following information presents both human experience and the results of scientific experiments used by qualified experts to assess the effects of PYDRAUL 29E hydraulic fluid on the health of industrially exposed individuals and to support the Precautionary Statements and Occupational Control Procedures recommended in this document. To avoid misunderstanding, the data provided in this section should be interpreted by individuals trained in evaluation of this type of information.

Human Experience

Dermal contact and inhalation are expected to be the primary routes of occupational exposure to PYDRAUL 29E hydraulic fluid. Repeated or prolonged contact with this material has been reported to cause dermal irritation. While studies in animals have demonstrated that one of the components of this material may cause inhibition of cholinesterase following dermal exposure, PYDRAUL 29E is not expected to present a significant health risk to employees if recommended safety precautions are followed. However, at elevated processing temperatures, the 2-ethylhexyldiphenyl phosphate ester blend component may produce a vapor that is toxic if inhaled.

Toxicological Data

Data from Monsanto studies indicate the following:

Oral LD₅₀ (Rat): 10,000 mg/kg, Practically Nontoxic

Dermal LD₅₀ (Rabbit): Greater than 7,940 mg/kg, Practically Nontoxic

Eye Irritation (Rabbit): (FHSA) 2.2 on a scale of 110.0, Slightly Irritating

Skin Irritation (Rabbit): (FHSA) 2.7 on a scale of 8.0, Slightly Irritating

Vapor Inhalation (Rat): Rats were exposed to a stream of air which passed through PYDRAUL 29E hydraulic fluid and led directly into the experimental chamber. Due to its low volatility, there was essentially no vaporization of the test material and the animals survived both the 6-hour exposure and subsequent 10-day observation periods without observable effects.

Components

Data from studies conducted by Monsanto on the components of PYDRAUL 29E hydraulic fluid indicate the following:

2-Ethylhexyldiphenyl Phosphate Ester Blend

Acute Vapor Inhalation (Rat): 3 of 5 rats died during a 10 day observation period following a 6 hour exposure to a nominal concentration of 3.0 mg 2-ethylhexyldiphenyl phosphate ester blend/liter of air. Significant weight loss was observed in the survivors. The sample concentrations were generated by passing air through a sample of phosphate ester blend heated to 163°C.

Aerosol Inhalation (Rat): No mortalities occurred in ten rats exposed to the 2-ethylhexyldiphenyl phosphate ester blend at a concentration (analytical) of 4.8 mg/l of air for 4 hours. Eye and respiratory irritation were observed in exposed animals. The sample was prepared as an aerosol heated to 125°C.

A repeat insult patch test on 200 human volunteers produced 30 primary irritation responses after a single application of the 2-ethylhexyldiphenyl phosphate ester blend. A second 48-hour application, 15 days after the initial application, produced similar irritation in 29 subjects. This material is considered a primary irritant but not a sensitizing agent.

A neurotoxicity study was conducted with the 2-ethylhexyldiphenyl phosphate ester blend in chickens. Adult hens were given oral doses of 10 g/kg for 3 consecutive days. This dosing regimen was repeated 21 days later for a total dose of 120 g/kg. No gross signs of neurological effects and no microscopic evidence of demyelination in brain, spinal cord or sciatic nerve were observed.

(Health Effects Summary Continued On The Next Page)

2-Ethylhexyldiphenyl Phosphate Ester Blend (Continued)

The 2-ethylhexyldiphenyl phosphate ester blend was evaluated for mutagenic potential in the following systems: microbial assays using five *Salmonella* strains and one strain of *Saccharomyces* yeast; *in vitro* induction of L5178Y TK mouse lymphoma cell point mutations; and *in vivo* induction of rat bone marrow cell clastogenesis. No evidence of mutagenicity was observed in any of these assays.

No teratogenic or fetotoxic effects were observed in the offspring of rats administered the 2-ethylhexyldiphenyl phosphate ester blend, by gavage, at a dose of 300, 1000 or 3000 mg/kg/day on days 6 through 15 of gestation. Maternal toxicity, as evidenced by reduced body weight gain, was noted in the mid- and high-dose groups.

p-t-Butylphenyl Diphenyl Phosphate Ester Blend

The p-t-butylphenyl diphenyl phosphate ester blend component of PYDRAUL 29E hydraulic fluid was applied to the intact and abraded skin of rabbits at doses of 10, 100 or 1000 mg/kg/day for 6 hours/day, 5 days/week for 3 weeks. Irritation of the skin at the site of application was apparent at all dose levels tested. Significant reductions in brain and erythrocyte cholinesterase activity were observed in high- and mid-dose animals. Plasma cholinesterase activity was significantly reduced in high- and mid-dose females. No treatment-related gross or microscopic pathologic changes were observed.

A neurotoxicity study was conducted with the p-t-butylphenyl diphenyl phosphate ester blend in chickens. Oral doses of 10 g/kg were given twice daily for 3 days. The same dosing regimen was repeated 21 days later for a total dose of 120 g/kg. No gross signs of neurological effects and no microscopic evidence of demyelination were observed.

In a 30-day feeding study, rats were fed p-t-butylphenyl diphenyl phosphate ester blend at doses of 250, 500, 750, 1000 and 2000 mg/kg/day. Reduced body weights were observed in high-dose females and in males given p-t-butylphenyl diphenyl phosphate ester blend at a dose of 750 mg/kg or higher. Hepatic enlargement and discolored livers were noted in all treatment groups in a dose-related fashion.

The p-t-butylphenyl diphenyl phosphate ester blend was evaluated in a 90 day toxicity study using rats given dietary concentrations of the test material at 0, 100, 3000 or 1000 ppm. No treatment-related deaths were observed. The hematological, urinalysis, and chemical chemistry studies which included cholinesterase activity levels showed no significant difference between the test and control animals. Gross pathological and histological evaluation of the tissues from the treated animals revealed no apparent treatment-related effects.

Rats were exposed by inhalation to the p-t-butylphenyl diphenyl phosphate ester blend at concentrations of 10.1 or 101.1 mg/m³, 6 hours/day, 5 days/week for 3 months. Intermittent rhinitis, sneezing, hemorrhagic conjunctivitis and wheezing were observed in high-dose males and females; increased liver-to-body weight ratios were observed in high-dose males. No adverse hematologic, biochemical, urinalysis or histopathologic effects were noted.

The p-t-butylphenyl diphenyl phosphate ester blend was evaluated for mutagenic potential in the L5178Y TK mouse lymphoma assay and in microbial assays using five *Salmonella* strains and one strain of *Saccharomyces* yeast. These assays were conducted with and without mammalian microsomal activation. No mutagenic response was observed.

No teratogenic or fetotoxic effects were observed in the offspring of rats administered the p-t-butylphenyl diphenyl phosphate ester blend, by gavage, at a dose of 300, 1000 or 3000 mg/kg/day on days 6 through 19 of gestation. Signs of maternal toxicity, as evidenced by a slight decrease in mean maternal body weight, were observed in the high-dose groups.

(Health Effects Summary Continued On The Next Page)

HEALTH EFFECTS SUMMARY (Continued)

Di(C₇₋₉₋₁₁-Alkyl)Phthalate Blend

In a four week feeding study, rats were given di(C₇₋₉₋₁₁-alkyl)phthalate blend at concentrations of 250, 500, 750, 1000 and 2000 mg/kg/day in the diet. Discolored livers were observed in male rats from the three highest dosage groups. The no-effect level was considered to be 500 mg/kg/day for the male rats. There were no adverse effects observed in the female rats at any treatment level.

The di(C₇₋₉₋₁₁-alkyl)phthalate blend was tested in a 90-day subacute oral toxicity study. Rats were fed 0, 1000, 3000, or 10000 ppm of the blend in their diets. An elevation in blood alkaline phosphatase and degenerative changes in livers of high-dose male rats were observed. High-dose females exhibited increased liver and kidney weights. The no-effect level is considered to be 3000 ppm.

In a 2 year chronic toxicity study, di(C₇₋₉₋₁₁-alkyl)phthalate blend was administered orally to rats at concentrations of 0, 300, 1000 and 3000 ppm (mean dosage levels of 0, 16, 54 and 161 mg/kg/day) in the diet for 28 months. Body weight increases and minor changes in clinical chemistry parameters were observed in both male and female rats. An increased incidence of neoplastic lesions was seen in both male and female animals at all dose levels. These were judged to be of no significance since the observed incidences and distributions were consistent with the normal biological variations observed in other studies with this strain of rat. However, data subsequently available from carcinogenicity studies on structurally-related compounds with this strain of rat indicated consistently increased incidences of mononuclear cell (large granular lymphocyte) leukemia. Moreover, the incidence with di(C₇₋₉₋₁₁-Alkyl)phthalate blend was similar to that seen with the other compounds. Consequently, it was concluded that there may be an association between this lesion and exposure to di(C₇₋₉₋₁₁-Alkyl)phthalate blend. Although the incidence of this finding in treated animals was increased about 50% over controls, no dose-response was evident; the incidence of leukemia was similar for males and females in all treated groups.

A six month aerosol inhalation study was conducted with di(C₇₋₉₋₁₁-alkyl)phthalate blend using monkeys, rats and guinea pigs. Animals were exposed to 0, 6.5, or 22.0 mg di(C₇₋₉₋₁₁-alkyl)phthalate blend/m³ of air, 6 hours per day, 5 days per week. No treatment-related effects were observed in monkeys or guinea pigs. Rats in the high exposure group exhibited significant increases in liver, kidney, pituitary, spleen and gonad weights. In monkeys and guinea pigs, the highest no-effect level is 22.0 mg/m³. For rats, the highest no-effect level is 6.5 mg/m³.

The di(C₇₋₉₋₁₁-alkyl)phthalate blend did not cause a mutagenic response in microbial assays with five *Salmonella* strains and one strain of *Saccharomyces* yeast, with and without microsomal activation, or in L5178Y TK mouse lymphoma cells in the presence of a metabolic activation system. An inconsistent, nonreproducible positive response was observed in the L5178Y TK mouse lymphoma cells in the absence of metabolic activation.

A teratogenicity study was conducted in rats on di(C₇₋₉₋₁₁-alkyl)phthalate blend. This material was orally administered to female rats at dosages of 0, 250, 1000 and 5000 mg/kg/day on days 6-19 of gestation. No evidence of maternal toxicity or teratogenicity was observed. Evidence of fetal toxicity was demonstrated by a decrease in mean fetal body weight in the high dosage group. The no effect level is considered to be 1000 mg/kg/day.

The phosphate ester blends discussed above contain triphenyl phosphate. Additional toxicity information is available for this component.

(Health Effects Summary Continued On The Next Page)

Triphenyl Phosphate

A neurotoxicity study was conducted with triphenyl phosphate in chickens. Oral doses of 5 g/kg were given twice daily for 3 consecutive days. The same dosing regimen was repeated 21 days later for a total dose of 60 g/kg. No gross signs of neurological effects and no treatment-related microscopic evidence of demyelination were observed.

A limited neurotoxicity study was conducted with triphenyl phosphate in cats. No evidence of axonal degeneration or demyelination in the spinal cord was reported following subcutaneous injections of 0.4, 0.7 or 1.0 g/kg.

In a preliminary short term screening assay, triphenyl phosphate was reported to induce no morphological alterations of nerve fibers, glial cells or neurons in isolated cultured sympathetic dorsal root ganglia from 10 to 11 day old chick embryos.

Triphenyl phosphate was applied to the intact and abraded skin of rabbits at dosages of 100 or 1000 mg/kg/day for 6 hours/day, 5 days/wk for 3 wks. Significant reductions in brain, and erythrocyte cholinesterase activity were observed in the high-dose animals. Plasma cholinesterase activity was significantly reduced in the high-dose females. No treatment-related gross or microscopic pathological changes were observed.

Rats were administered triphenyl phosphate at dietary concentrations of 0.1 and 0.5 percent for 35 days. A slight decrease in growth rate and increased liver weights were reported in the high dose group. No treatment-related hematologic or gross abnormalities were reported.

Triphenyl phosphate was injected intraperitoneally into strain A mice in total doses of 80 to 360 mg/kg over a 1 day to 6 week period. Twenty-four weeks after the initial injection, the animals were sacrificed and examined for the presence of lung tumors. Triphenyl phosphate did not increase the incidence of pulmonary tumors.

Triphenyl phosphate was evaluated for mutagenic potential in the L5178Y TK mouse lymphoma mutation assay and in a microbial mutagenicity assay using five *Salmonella* strains and one strain of *Saccharomyces* yeast. These assays were conducted with and without mammalian microsomal activation. No mutagenic effects were observed.

Additional Information

A Threshold Limit Value (TLV) has been established by the American Conference of Governmental Industrial Hygienists for triphenyl phosphate, a component of PYDRAUL 29E. For further information on this material, please refer to the current edition of the *Documentation of Threshold Limit Values*.

PHYSICAL DATA

Appearance:	Clear to slightly hazy blue liquid
Specific Gravity (25/25°C):	1.090 - 1.110
Viscosity @ 100°F (38°C):	29 - 34 centistokes
Pour Point:	-40°F (-40°C)
Boiling Point @ 760 mm Hg:	500°F (260°C)
Vapor Pressure @ 200°F (93°C):	0.002 mm Hg
Vapor Density (Air = 1):	Greater than 1
Solubility in Water:	Practically insoluble

Note: These physical data are typical values based on material tested but may vary from sample to sample. Typical values should not be construed as a guaranteed analysis of any specific lot or as specification items.

SPILL, LEAK & DISPOSAL INFORMATION

Emergency Spill and

Leak Information: Spill, should be confined and absorbed on a suitable medium such as sawdust, clay, or filtercel and disposed of as recommended below.

Disposal Information: Waste product should be incinerated. Absorbed spills or leaks should be incinerated or disposed of in a hazardous waste landfill which complies with local, state, and federal regulations.

This material, should not be dumped, spilled, rinsed, or washed into sewers or public waterways.

ADDITIONAL COMMENTS

Refer to Monsanto Technical Bulletin IC/FP-3 for information on reclaiming PYDRAUL 29E hydraulic fluid.

This product should not contact or in any way contaminate food, animal feed, food or feed products, food or feed chemicals, food or feed packaging materials, pharmaceuticals or any items which may directly or indirectly be ultimately ingested by humans, animals, wildlife or aquatic life. Any such substance contaminated with this product should be destroyed.

PYDRAUL 29E is approved by Factory Mutual as a fire resistant hydraulic fluid.

Environmental Toxicity Information:

PYDRAUL 29E

48-hr LC₅₀ *Daphnia magna*: 0.32 mg/l, Highly Toxic
 96-hr LC₅₀ Fathead minnow: 0.6 mg/l, Highly Toxic
 96-hr LC₅₀ Rainbow trout: 1.4 mg/l, Moderately Toxic
 96-hr LC₅₀ Bluegill sunfish: 1.5 mg/l, Moderately Toxic

2-Ethylhexyldiphenyl Phosphate Ester Blend

48-hr LC₅₀ Midge larvae: 0.5 mg/l, Highly Toxic
 96-hr EC₅₀ Algae: 0.2 mg/l, Highly Toxic

Daphnia magna were exposed to the 2-ethylhexyldiphenyl phosphate ester blend component of PYDRAUL 29E at concentrations of 6, 12, 18, 43 and 75 µg/l through one generation (21 days). All *Daphnia* exposed to the highest test concentration died. Reduced reproduction was observed at concentrations of 43 µg/l and higher. The maximum acceptable toxicant concentration was considered to be between 18 and 43 µg/l.

Rainbow trout eggs and fry were exposed to 2-ethylhexyldiphenyl phosphate ester blend concentrations of 21, 51, 93, 192 and 345 µg/l. No treatment-related effects were observed on egg hatchability, behavior, backbone curvature or growth of the fry. Survival was reduced at a concentration of 51 µg/l or higher. The maximum acceptable toxicant concentration was considered to be between 21 and 51 µg/l.

The 2-ethylhexyldiphenyl phosphate ester blend was evaluated in a series of aquatic studies to determine its half-life and biodegradability. This material had a half-life of 1 to 5 days and its biodegradability was classed as intermediate to readily degraded.

The bioconcentration potential of the 2-ethylhexyldiphenyl phosphate ester blend in bluegill was measured over a 36-day period. It was determined that this blend has a low potential to bioaccumulate in fish.

(Additional Comments Continued On The Next Page)

ADDITIONAL COMMENTS (Continued)

p-t-Butylphenyl Diphenyl Phosphate Ester Blend

48-hr LC₅₀ Midge larvae: 1.9 mg/l, Moderately Toxic
 96-hr EC₅₀ Algae: 2.6 - 3.0 mg/l, Moderately Toxic
 96-hr LC₅₀ Mysid shrimp: 2.5 mg/l, Moderately Toxic
 96-hr LC₅₀ Sheepshead minnow: 3.0 mg/l, Moderately Toxic

Daphnia magna were exposed to the p-t-butylphenyl diphenyl phosphate ester blend concentrations of 5.1 to 100 mg/l through one generation (21 days). Survival and reproduction of *Daphnia* were reduced at 100 mg/l. The maximum acceptable toxicant concentration was considered to be between 40 and 100 mg/l.

Fathead minnow eggs and fry were exposed to p-t-butylphenyl diphenyl phosphate ester blend concentrations of 0.125, 0.25, 0.5, 1.0 and 2.0 mg/l. No treatment-related effects were observed on hatchability of the eggs. Fry survival was reduced at a concentration of 1.0 mg/l and higher. Fry weight and length were reduced at a concentration of 0.5 mg/l and higher. The maximum acceptable toxicant concentration was considered to be between 0.25 and 0.5 mg/l.

The p-t-butylphenyl diphenyl phosphate ester blend was evaluated in a 24-hour microbial semi-continuous activated sludge test. The primary degradation was 51%; biodegradability was classified as intermediate. A river die-away test was conducted on this material. This material was exposed to natural microorganisms in replicate water samples. The predicted environmental half-life of the p-t-butylphenyl diphenyl phosphate ester blend based upon this study was two days.

The bioconcentration potential of the p-t-butylphenyl diphenyl phosphate ester blend in bluegill was measured over a 26-day period. It was determined that this blend has a moderate potential to bioaccumulate in fish.

Di(C₇₋₉₋₁₁-Alkyl)Phthalate Blend

48-hr LC₅₀ Midge larvae: Greater than 10 mg/l, Slightly Toxic
 96-hr EC₅₀ Marine algae: Greater than 1,000 mg/l, Practically Nontoxic
 96-hr EC₅₀ Freshwater algae: Greater than 1,000 mg/l, Practically Nontoxic
 96-hr LC₅₀ Mysid shrimp: Greater than 1,000 mg/l, Practically Nontoxic
 96-hr LC₅₀ Sheepshead minnow: Greater than 1,000 mg/l, Practically Nontoxic

Fathead minnow eggs and fry were exposed to the di(C₇₋₉₋₁₁-alkyl)phthalate blend component of PYDRAUL 29E hydraulic fluid at concentrations of 22, 44, 78, 154 and 256 µg/l. No treatment-related effects were observed on viability and hatchability of eggs or survival, weight and length of the fry. The no-significant toxic effect level was 256 µg/l.

The di(C₇₋₉₋₁₁-alkyl)phthalate blend component was evaluated in a series of aquatic studies to determine its biodegradability. This component had a half-life of 5 to 8 days and its biodegradability was classified as intermediate.

The bioconcentration potential of the di(C₇₋₉₋₁₁-alkyl)phthalate blend in bluegill was measured over a 22-day period. The bioconcentration potential of this blend was considered to be negligible.

(Additional Comments Continued On The Next Page)

ADDITIONAL COMMENTS (Continued)

Triphenyl Phosphate

48-hr LC₅₀ *Daphnia magna*: 1.0 mg/l, Highly Toxic
 48-hr LC₅₀ Midge larvae: 1.6 mg/l, Moderately Toxic
 96-hr LC₅₀ Rainbow trout: 0.32 ppm, Highly Toxic
 96-hr LC₅₀ Bluegill sunfish: 3.16 ppm, Moderately Toxic
 96-hr LC₅₀ Algae: 2 mg/l, Moderately Toxic
 96-hr LC₅₀ Sheepshead minnows: Estimated to be between 0.32 and 0.56 mg/l, Highly Toxic
 96-hr LC₅₀ Fathead minnows: 0.66 ppm, Highly Toxic
 96-hr LC₅₀ Mysid shrimp: Estimated to be between 0.18 and 0.32 mg/l, Highly Toxic

Fathead minnow eggs were exposed to Triphenyl phosphate concentrations of 2.8, 12, 36, 87 and 230 µg/l. No treatment-related effects were observed in hatchability of eggs or on weight and length of the fry. Fry survival was reduced at 230 µg/l. The maximum acceptable toxicant concentration is considered to be between 87 and 230 µg/l.

Triphenyl phosphate was evaluated in a series of aquatic studies to determine its half-life and biodegradability. Triphenyl phosphate had a half-life of 2 to 4 days and it was classed as readily biodegradable.

The bioconcentration potential of the Triphenyl phosphate was measured over a 26 day period. It was determined that Triphenyl phosphate has a low potential to bioaccumulate in fish.

DATE: 4/18/86

SUPERSEDES: 9/19/84

MSDS NO.: M00006619

FOR ADDITIONAL NON-EMERGENCY INFORMATION, CONTACT:

MSDS Coordinator
 Specialty Chemicals
 Monsanto Chemical Company
 (314) 694-1000
 (A Unit of Monsanto Company)

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PYDRAUL® is a registered trademark of Monsanto Company.

TLV† is a registered trademark of the American Conference of Governmental Industrial Hygienists (ACGIH).

PYDRAUL® 29E Fire Resistant Hydraulic Fluid

MATERIAL SAFETY DATA

CARPENTER TECHNOLOGY CORPORATION

Certech

GENERAL OFFICES:
P.O. BOX 662
READING, PA 19603

MATERIAL SAFETY DATA SHEET

RECEIVED
JUL 13 1987

CERRO COPPER PRODUCTS
DIV CERRO CORP
P O BOX 681
EAST ST LOUIS IL 62202

CERRO COPPER PRODUCTS COMPANY
MSSS NUMBER - CCPC-80-0207

ENVIRONMENTAL: _____
SAFETY: _____
PURCHASING: _____

ABILITY OR FITNESS OF ANY NATURE WITH RESPECT TO THE
MATERIAL OR DATA HEREIN IS MADE HEREUNDER.

FOR ADDITIONAL INFORMATION, PLEASE CONTACT THE HEALTH AND SAFETY DEPARTMENT AT: 215-371-2000.

SECTION I - PRODUCT IDENTIFICATION

PRODUCT DESCRIPTION: **PYRODOL 7 TOOL STEEL
HOLLOW BAR - DOUBLE AGED**

PINK PAINT

SECTION II - HAZARDOUS INGREDIENTS

INGREDIENTS	%	PEL / TLV 8 HOUR TWA UNLESS OTHERWISE NOTED	
		PEL	TLV
NICKEL	52.53	PEL 1.0 MG/M3	TLV 1.0 MG/M3
7440-02-0		PEL 10.0 MG/M3	TLV 5.0 MG/M3
IRON *	19.50	PEL 1.0 MG/M3	TLV 0.5 MG/M3
1309-37-1		PEL 5.0 MG/M3	TLV 5.0 MG/M3
CHROMIUM	19.00	PEL 15.0 MG/M3 (INSOLUBLE COMPOUNDS)	TLV 10.0 MG/M3 (INSOLUBLE COMPOUNDS)
7440-47-3		PEL 15.0 MG/M3	TLV 10.0 MG/M3
TANTALUM	5.00	PEL 0.1 MG/M3	TLV 0.1 MG/M3
7440-25-7		PEL 0.1 MG/M3	TLV 0.1 MG/M3
MOLYBDENUM	3.00	PEL 0.1 MG/M3	TLV 0.1 MG/M3
7439-98-7		PEL 0.1 MG/M3	TLV 0.1 MG/M3
TITANIUM *	1.00	PEL 0.1 MG/M3	TLV 0.1 MG/M3
63-67-7		PEL 0.1 MG/M3	TLV 0.1 MG/M3
AL	.20	PEL 0.1 MG/M3	TLV 0.1 MG/M3
7440-48-4		PEL 0.1 MG/M3	TLV 0.1 MG/M3

* - THESE SUBSTANCES ARE REGULATED IN THEIR OXIDE FORM

THE ABOVE PERCENT CONCENTRATIONS ARE CONSIDERED NOMINAL AND ARE PROVIDED FOR INDUSTRIAL HYGIENE PURPOSES.
THEY DO NOT REPRESENT A CERTIFICATION OF CONTENT.

SECTION III - PHYSICAL DATA

BOILING PT.: HIGH
MELTING PT.: 2400 to 2800 F
SPECIFIC GRAVITY: 7.5 to 8.5
VAPOR PRESSURE: NIL
VAPOR DENSITY: NIL
SOLUBILITY IN WATER: INSOLUBLE
APPEARANCE AND ODOR: SOLID,
ODORLESS METAL

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

UNLESS OTHERWISE NOTED, NONE. PRODUCT IS A SOLID METAL.
NOTES:

SECTION V - HEALTH HAZARD DATA

SPECIALTY STEEL ALLOYS ARE GENERALLY NOT CONSIDERED HAZARDOUS IN THE FORM SHIPPED (SOLID BARS, BILLETS, RODS, WIRE, ETC.). HOWEVER, IF YOUR PROCESS INVOLVES GRINDING, MELTING, WELDING, CUTTING, OR ANY OTHER PROCESS THAT CAUSES A RELEASE OF DUST OR FUME, HAZARDOUS LEVELS OF DUST OR FUME OF THE CONSTITUENTS OF THESE ALLOYS COULD BE GENERATED. THE FOLLOWING IS A LIST OF POTENTIAL HEALTH EFFECTS FOR ALL HAZARDOUS ELEMENTS THAT ARE POSSIBLY CONTAINED IN ANY OF OUR ALLOYS. PLEASE REFER TO SECTION II TITLED "HAZARDOUS INGREDIENTS" FOR A LIST OF THOSE SPECIFIC ELEMENTS CONTAINED IN THIS PARTICULAR ALLOY.

HEALTH EFFECTS:

- *ALUMINUM: METAL DUST AND OXIDE IS GENERALLY CONSIDERED A "NUISANCE" PARTICULATE. MAY CAUSE IRRITATION OF THE EYES, NOSE, AND THROAT IN EXCESSIVE CONCENTRATIONS.
- *BERYLLIUM: CAN CAUSE DERMATITIS, ALSO CAUSES A SEVERE CHRONIC LUNG DISEASE KNOWN AS "CHRONIC BERYLLIUM DISEASE" WHICH IS OFTEN FATAL.
- *IRON OXIDE: HAS CAUSED IRRITATION OF THE EYES, NOSE, AND SKIN OF EXPERIMENTAL ANIMALS. IT MAY HAVE THE SAME EFFECT ON HUMANS.
- CHROMIUM: FERROCHROME ALLOYS HAVE BEEN ASSOCIATED WITH LUNG CHANGES IN WORKERS EXPOSED TO THESE ALLOYS.
- COBALT: FUME OR DUST CAUSES IRRITATION OF THE NOSE AND THROAT AND MAY CAUSE AN ALLERGIC SKIN RASH. ALSO HAS BEEN REPORTED TO CAUSE RESPIRATORY DISEASE WITH SYMPTOMS RANGING FROM COUGH AND SHORTNESS OF BREATH TO PERMANENT DISABILITY AND DEATH. THE SYMPTOMS FREQUENTLY GO AWAY WHEN EXPOSURE HAS STOPPED, BUT SOMETIMES THE SYMPTOMS PROGRESS AFTER EXPOSURE HAS CEASED.
- COPPER: FUME OR DUST CAUSES IRRITATION OF THE EYES, NOSE, AND THROAT AND A FLU-LIKE ILLNESS CALLED METAL FUME FEVER. SYMPTOMS INCLUDE FEVER, MUSCLE ACHES, NAUSEA, CHILLS, DRY THROAT, COUGH, WEAKNESS, AND SWEET OR METALLIC TASTE IN THE MOUTH.

SECTION V - HEALTH HAZARD DATA (CONTINUED)

HAFNIUM: HAFNIUM SALTS HAVE CAUSED IRRITATION OF THE EYES AND SKIN IN EXPERIMENTAL ANIMALS. OTHER HAFNIUM COMPOUNDS HAVE CAUSED LIVER DAMAGE IN ANIMALS ON PROLONGED FEEDING.

IRON OXIDE: REPEATED EXPOSURE TO IRON OXIDE FUME OVER A PERIOD OF YEARS MAY CAUSE X-RAY CHANGES OF THE LUNGS, BUT DOES NOT CAUSE T EXPOSED PERSON TO BECOME ILL.

MANGANESE: INHALATION OF MANGANESE FUME MAY CAUSE "METAL FUME FEVER" WITH SYMPTOMS OF CHILLS, FEVER, NAUSEA, COUGH, DRY THROAT, WEAKNESS, MUSCLE ACHES, AND A SWEET OR METALLIC TASTE IN THE MOUTH. PROLONGED OR REPEATED EXPOSURE MAY AFFECT THE NERVOUS SYSTEM, WITH DIFFICULTY IN WALKING AND BALANCING, WEAKNESS OR CRAMPS IN THE LEGS, HOARSENESS OF THE VOICE, TROUBLE WITH MEMORY OR JUDGEMENT, UNSTABLE EMOTIONS OR UNUSUAL IRRITABILITY. THE RESPIRATORY SYSTEM MAY ALSO BE AFFECTED BY A PNEUMONIA LIKE ILLNESS WITH SYMPTOMS OF COUGHING, FEVER, CHILLS, BODY ACHE, CHEST PAIN AND OTHER COMMON SIGNS OF PNEUMONIA.

MOLYBDENUM: OXIDES OF MOLYBDENUM HAVE CAUSED IRRITATION OF THE EYES, NOSE, AND THROAT, WEIGHT LOSS, AND DIGESTIVE DISTURBANCES IN EXPERIMENTAL ANIMALS.

NICKEL: FUMES ARE RESPIRATORY IRRITANTS AND MAY CAUSE RESPIRATORY DISEASE. SKIN CONTACT CAN ALSO CAUSE AN ALLERGIC SKIN RASH. NICKEL AND ITS COMPOUNDS HAVE BEEN REPORTED TO CAUSE CANCER OF THE LUNGS AND SINUSES.

TANTALUM: GENERALLY CONSIDERED TO HAVE A LOW ORDER OF TOXICITY BUT HAS PRODUCED TRANSIENT LESIONS OF THE LUNGS IN EXPERIMENTAL ANIMALS.

TIN: GENERALLY CONSIDERED TO EXHIBIT A LOW ORDER OF TOXICITY. MAY CAUSE IRRITATION OF THE EYES, NOSE, THROAT AND SKIN.

TITANIUM DIOXIDE: CONSIDERED TO BE A "NUISANCE" PARTICULATE. CAN CAUSE IRRITATION OF THE EYES, NOSE, AND THROAT IN HIGH CONCENTRATIONS. SLIGHT LUNG CHANGES MAY OCCUR.

***TUNGSTEN:** METAL AND INSOLUBLE COMPOUNDS ARE GENERALLY CONSIDERED TO HAVE A LOW ORDER OF TOXICITY, BUT HAVE PRODUCED LUNG CHANGES IN EXPERIMENTAL ANIMALS.

VANADIUM PENTOXIDE: DUST AND FUME MAY CAUSE IRRITATION OF THE EYES, NOSE, THROAT, AND RESPIRATORY TRACT. IT MAY ALSO CAUSE BRONCHITIS WITH WHEEZING AND CHEST PAIN. A GREENISH DISCOLORATION OF THE TONGUE MAY OCCUR. AFTER SYMPTOMS HAVE OCCURRED FOLLOWING INITIAL EXPOSURE, REPEATED EXPOSURE MAY CAUSE MORE SEVERE SYMPTOMS OF THE SAME NATURE. REPEATED EXPOSURES MAY CAUSE CHRONIC BRONCHITIS, OR ALLERGIC SKIN RASH.

ZIRCONIUM: GENERALLY CONSIDERED TO HAVE A LOW ORDER OF TOXICITY. SKIN RASH HAS BEEN REPORTED FROM EXPOSURE TO ZIRCONIUM CONTAINING DEODORANTS.

REFERENCES: HEALTH HAZARD DATA FOR THE ELEMENTS MARKED WITH AN (*) WAS TAKEN FROM ACGIH'S DOCUMENTATION OF TLV'S. HEALTH HAZARD DATA FOR THE REMAINING ELEMENTS WAS TAKEN FROM THE NIOSH / OSHA OCCUPATIONAL HEALTH GUIDELINES FOR CHEMICAL HAZARDS. FOR ADDITIONAL SOURCES OF INFORMATION ON POTENTIAL HEALTH EFFECTS OF THESE SUBSTANCES, PLEASE REFER TO OSHA'S HAZARD COMMUNICATION STANDARD (29 CFR 1910.1200) APPENDIX C.

CARCINOGENIC REFERENCES: CHROMIUM, COBALT-CHROMIUM ALLOYS, AND NICKEL HAVE BEEN IDENTIFIED BY THE INTERNATIONAL AGENCY FOR RESEARCH ON CANCER (IARC) AND / OR THE NATIONAL TOXICOLOGY PROGRAM (NTP) AS POTENTIAL CANCER CAUSING AGENTS.

EXPOSURE ROUTES:

EXPOSURE TO SPECIALTY STEEL ALLOYS OCCURS PRIMARILY FROM INHALATION OF DUST OR FUMES. HOWEVER, CONSTITUENTS OF THESE ALLOYS M. CAUSE EFFECTS DIRECTLY UPON THE SKIN OR EYES. CERTAIN CONSTITUENTS MAY ALSO BE HARMFUL IF SWALLOWED.

FIRST AID:

INHALATION - MOVE PERSON TO FRESH AIR UNTIL RECOVERED, CONSULT A PHYSICIAN.

SKIN - WASH WITH WATER AND MILD DETERGENT, CONSULT A PHYSICIAN.

EYE - FLUSH THOROUGHLY WITH WATER, CONSULT A PHYSICIAN.

INGESTION - WHILE INGESTION OF LARGE ENOUGH QUANTITIES TO CAUSE HEALTH EFFECTS IS UNLIKELY, CONSULT A PHYSICIAN IF IT OCCURS.

SECTION VI - REACTIVITY

STABILITY: STABLE

INCOMPATIBLE MATERIALS: NONE

HAZARDOUS DECOMPOSITION: NONE

POLYMERIZATION: WILL NOT OCCUR

SECTION VII - SPILL OR LEAK PROCEDURES

PRODUCT IS A SOLID METAL AS SHIPPED NO POTENTIAL FOR SPILL OR LEAK.

SECTION VIII - SPECIAL PROTECTION INFORMATION

VENTILATION:

IF YOUR PROCESS CAUSES A RELEASE OF DUST OR FUME, USE LOCAL AND GENERAL EXHAUST VENTILATION TO KEEP AIRBORN CONCENTRATIONS OF DUST OR FUMES BELOW THE TLV.

RESPIRATORY PROTECTION:

IF YOUR PROCESS CAUSES A RELEASE OF DUST OR FUME IN EXCESS OF THE PERMISSIBLE EXPOSURE LIMIT, NIOSH APPROVED RESPIRATORS FOR PROTECTION AGAINST AIRBORN DUST OR FUMES SHOULD BE WORN. RESPIRATORS SHOULD BE USED IN ACCORDANCE WITH 29CFR 1910.134.

PROTECTIVE EQUIPMENT:

GLOVES AND BARRIER CREAMS MAY BE NECESSARY TO PREVENT SKIN SENSITIZATION AND DERMATITIS. IF YOUR PROCESS INVOLVES GRINDING OR ANY OTHER ACTION THAT CAUSES THE RELEASE OF DUST OR FUMES, APPROVED SAFETY GLASSES OR GOGGLES SHOULD BE WORN.

SECTION IX - SPECIAL PRECAUTIONS

NONE

Quigley Company, Inc.
A subsidiary of Pfizer Inc.
233 East 42nd Street
New York, NY 10017

Product: G-COTE 6682

MSDS No: QUIGLEY / F1027

Revision: 01

Date: January, 1989

GERARD CORP. PROD. CO. COMPANY
MSDS NUMBER - CCPC-00-0008

SECTION III. PHYSICAL

Appearance & Odor: Gray Slurry, alcohol odor

Water solubility (%): Insoluble
pH: 1.7-2.7

Specific gravity (H₂O=1): 1.42 @ 72°F
11.8 lbs/gal

Viscosity - 1500-2000 cps @ 72°F
Freeze Point - Less than 10°F

SECTION IV. FIRE AND EXPLOSION DATA

Flash Point (method): 105°F (PMCC)

NFPA Fire Hazard Symbol Codes: Flammability: 2 Health: 1 Reactivity: 0 Special: 0

Extinguishing Media: Use dry chemical, alcohol foam, carbon dioxide or other extinguishing agent suitable for Class B fires. Use water to cool containers exposed to fire. For large fires, use water spray or fog, thoroughly drenching the burning material.

Unusual fire or explosion hazards: None

Special fire-fighting procedures: None

SECTION V. REACTIVITY DATA

Material is stable Hazardous polymerization will not occur

Chemical incompatibilities: Avoid contact with hydrofluoric acid, which can generate silicon tetrafluoride gas.

Conditions to avoid: None

Hazardous decomposition Products: None

SECTION VI. HEALTH HAZARD INFORMATION

Summary of risks: May cause irritation to eyes, skin and respiratory tract. Long term overexposure to silica may produce silicosis, lung injury. Prolonged inhalation of mist or vapor may cause nausea, dizziness, light-headedness, vomiting or unconsciousness depending on the length of exposure and the first aid action given.

Target organs: Lungs

Primary entry route(s): Inhalation, ingestion, skin and eye contact.

Acute effects: May cause irritation to eyes, skin and respiratory tract. Short term exposure to silica can produce cough, wheezing and dyspnea. Prolonged inhalation of mist or vapor may cause nausea, dizziness, light-headedness, vomiting or unconsciousness depending on the length of exposure and the first aid action given.

Chronic effect(s): Long term exposure to silica causes silicosis, a form of pulmonary fibrosis. Continued exposure to silica can lead to cardiopulmonary impairment.

Material Safety Data Sheet

Quigley Company, Inc.
A subsidiary of Pfizer Inc.
235 East 42nd Street
New York, NY 10017

Product: Q-COTE 6682

MSDS No: QUIGLEY / F1027

Revision: 01

Date: January, 1989

HEALTH HAZARD INFORMATION continued from page 2

First aid:

Eye contact: Flush out eyes with generous amounts of water for at least 15 minutes. If irritation persists, see a Physician.

Skin contact: Wash from skin with mild soap and water.

Inhalation: Remove from exposure area.

Ingestion: Induce vomiting. Give water. Call a Physician.

Crystalline silica has been reviewed by IARC. IARC found limited evidence for carcinogenicity of crystalline silica in humans and sufficient evidence in experimental animals.

SECTION VII. SPILL, LEAK AND DISPOSAL PROCEDURES

Spill / Leak procedures: Normal clean-up procedures. Care should be taken to avoid causing dust to become airborne. Vacuum cleaning systems are recommended. Respiratory protection not normally needed while in the slurry state. If the material dries, and airborne dust is present, wear a NIOSH approved respirator. Keep the spill away from heat, sparks, flames and welding operations. Ventilate area and evacuate employees from exposure if the airborne concentration exceeds the TLV.

Waste management / Disposal: Disposal must be made in accordance with Federal, State and local regulations. If this product becomes a waste, it does meet the criteria of a hazardous waste as defined under the Resource Conservation and Recovery Act (RCRA) 40 CFR 261. Hazardous waste D001.

As a hazardous liquid waste, it must be solidified before disposal in a landfill (Hazardous Waste Treatment, Storage and Disposal facility).

For transportation emergencies, call CHEMTREC, 24 hour information service, 1-800-424-9300.

SECTION VIII. SPECIAL PROTECTION INFORMATION

Personal protective equipment:

Goggles: Chemical goggles

Gloves: Impervious gloves

Respirator: In the slurry state and if there are significant levels of vapors or mists, a NIOSH approved or equivalent organic vapor respirator is recommended. If the material is allowed to dry and there are exposures to airborne silica, use of an approved dust mask or particulate respirator is recommended when exposure limits may be exceeded. The Protection Factor of the respirator should be adequate for the particular dust exposure level.

Other: For large spills, entry into large tanks, vessels or enclosed small spaces with inadequate ventilation, a pressure-demand, self-contained breathing apparatus is recommended.

Quigley Company, Inc.
A subsidiary of Pfizer Inc.
235 East 42nd Street
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Product: G-COTE 6682

MSDS No: QUIGLEY / F1027

Revision: 01

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SPECIAL PROTECTION INFORMATION continued from page 3

Workplace considerations:

Ventilation: Local exhaust ventilation to collector or containment recommended to control dust to below exposure limits.

Safety stations:

Safety eye wash and shower station should be available to the work area.

SECTION IX. SPECIAL PRECAUTIONS

Other precautions: Good industrial hygiene practice requires that employee exposure be maintained below the recommended TLV. This is preferably achieved through the provision of adequate ventilation where necessary. Where dust cannot be controlled in this way, personal respiratory protection should be employed.

DOT Class: Combustible Liquid, N.O.S. NA

1993

Prepared/revised by: G. J. L. Wilson

January, 1989

DELIVERY SLIP #

#

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DATE RECEIVED

2-7-89

DELIVERED TO

J. FERREL

CONTENTS CHECKED BY

Ch J J

COMMENTS ON CONDITION

The data and recommendations presented herein are based upon a review of Quigley files, published MSDS's, and standard toxicological reference sources. Quigley makes no guarantee or warranty, either express or implied as to the accuracy or completeness of these data and recommendations.

CERRO COPPER PRODUCTS
COMPANY --- SAUGET, IL
MSDS NUMBER ASSIGNED
CCPC-00-0209

000
0209

EET
PYROTROL W200

MANUFACTURER'S NAME Piedmont Minerals Company, Incorporated		CONTACT Technical Dept.
ADDRESS (STREET, CITY, STATE AND ZIP CODE) 3514 W. Wendover Ave., Greensboro, N.C. 27407		EMERGENCY TELEPHONE NO. (919) 292-0949
TRADE NAME, COMMON NAME OR SPECIFICATION Pyrofrac, Pyrotrol, Pyrophyl		APPROVED BY JRS DATE 4-13-88
CHEMICAL FAMILY OR PRODUCT TYPE Inorganic Oxides		

SECTION II COMPOSITION

CHEMICAL NAME	%	COMMON NAME	REG. (Y/N)	CAS #	OSHA 3 PERMISSIVE EXPOSURE LIMIT	ACGIH 3 TLV	CARCIN- OGEN 4 (Y/N)
Pyrophyllite	<50	Same	Y	12269-78-2	NAIF	.53 mg/m ³	N
Silicon Dioxide	50	Quartz	Y	7631-86-9	(4)	(4)	N
Andalusite	<50	Same	Y	12183-80-1	NAIF	NAIF	N

(4) TLV's for free quartz (crystalline silica) may be calculated as follows:
 TLV (total dust) = 30 mg/m³ + (% crystalline quartz + 2)
 TLV (respirable dust) = 10 mg/m³ + (% crystalline quartz + 2)
 For cristobalite and tridymite, use 1 1/2 quartz values
 Regulated as per lists: OSHA 29 CFR 1910, sub-part Z, ACGIH, IHS/NTP and IARC
 2 Regulated as per lists: NTP Annual Report on Carcinogens, IARC Monographs.

SECTION III PHYSICAL AND CHEMICAL DATA

Percent Volatile by Volume: 0%
 Solubility in Water: Negligible
 Bulk Density: 50 - 110 lbs./cu.ft.
 P.C.E.: 20 - 31
 pH (10% solution): 6-7
 Physical Appearance: White to medium tan grains and powder with earthy odor.

SECTION IV FIRE AND EXPLOSION HAZARD DATA

Flash Point--Explosion Potential--Flammable Limits--Extinguishing Media
This product is non flammable and will not support combustion

SECTION V HEALTH AND FIRST AID (SEE SECTION II FOR TLV)

Inhalation: Nuisance dust. See Section IX. FIRST AID: Remove to dust-free area.
 Skin: NAIF
 Eyes: May abrade eyes. FIRST AID: Flush eyes with water for at least fifteen (15) minutes. Seek medical attention.
 NOTE: See Section IX.

NOTE: The two numbers in the TLV and PEL columns represent the respirable/total fraction.

SECTION VI CORROSIVITY AND REACTIVITY DATA

Stability: Stable Conditions to be avoided: NAIF
Polymerization: Will not occur
Incompatibility: NAIF

SECTION VII STORAGE, HANDLING AND USE PROCEDURES

Normal Storage and Handling: See below.

Normal Use: Good housekeeping and good hygienic practices should be used.

Steps to be taken in case of leaks or spills: Employ dust-free clean-up procedures.

Waste Disposal Method: The tearout and disposal of this product may generate dust. During tearout, observe the exposure limits outlined in Section II, and the personal protection precautions in Section VIII. Disposal shall be in accordance with Federal, State, and Local regulations.

SECTION VIII PERSONAL PROTECTION INFORMATION

RESPIRATORY PROTECTION (SPECIFY TYPE Use NIOSH or MSHA approved respirator.)

ENTILATION	LOCAL Sufficient to keep dust below TLV's.
	MECHANICAL (GENERAL)
	OTHER
PROTECTIVE GLOVES	Recommended
EYE PROTECTION	Recommended
OTHER EQUIPMENT	NAIF

SECTION IX SPECIAL PRECAUTIONS

This product contains Silica. Inhalation of this dust in the respirable size range presents a potential health hazard. Excessive inhalation will increase your risk of serious respiratory disease (Silicosis).

FOR COMPANY USE

The information and recommendations set forth herein are taken from sources believed to be accurate as of the date hereof; however Piedmont makes no warranty with respect to the accuracy of the information or the suitability of the recommendations, and assumes no liability to any user thereof.

~~Enlube Rapeseed Oil~~

C O N F I D E N T I A L

Please restrict the use to your internal company requirements.

M A T E R I A L S A F E T Y D A T A S H E E T

ENGINEERED LUBRICANTS CO.
11525 Rock Island Court
Maryland Heights, Misso
Emergency Phone Number: (

CCFPO COPPER PRODUCTS COMPANY
NEEDS NUMBER - CCFPO-CO-0010
DATE: 11/11/81
ENVIRONMENTAL: _____
SAFETY: _____
STORAGE: _____

SECTION I

MANUFACTURER'S NAME ENGINEERED LUBRICANTS CO.
ADDRESS 11525 Rock Island Court
 Maryland Heights, MO 63043
TRADE NAME ENLUBE Rapeseed Oil
GENERIC DESCRIPTION Vegetable Oil

SECTION II HAZARDOUS INGREDIENTS

	Percent	TLV Units
None Known		
There are no known carcinogens according to current, published IARC, NTP & OSHA information.		

SECTION III PHYSICAL DATA

BOILING POINT: Decomposes SPECIFIC GRAVITY (H₂O=1): 0.92

SOLUBILITY IN WATER: Insoluble % VOTATILE BY VOLUME: Nil

EVAPORATION RATE (____=1): N/A

APPEARANCE & ODOR: Clear Amber Liquid with Bland Odor

SECTION IV FIRE & EXPLOSION HAZARD DATA

FLASH POINT, °F: >600 METHOD USED: COC

EXTINGUISHING MEDIA: CO₂, Dry Chemical, Foam

SPECIAL FIRE FIGHTING PROCEDURES: Fire fighters should wear self-contained breathing gear when in confined areas.

UNUSUAL FIRE & EXPLOSION HAZARDS: None known

SECTION V HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE: None Established

EFFECTS OF OVER-EXPOSURE: May cause minor irritation to sensitive skin with prolonged or repeated contact. May cause eye irritation. Avoid breathing mists or vapors.

EMERGENCY & FIRST AID PROCEDURES: Wash thoroughly with soap & water. Flush eyes with running water. If irritated or if irritation persists, consult physician. Wash contaminated clothing before reuse.

CONFIDENTIAL

Please restrict the use to your internal company requirements.

SECTION VI REACTIVITY DATA

STABILITY: Stable CONDITIONS TO AVOID: Excessive Heat
INCOMPATIBILITY: Strong Oxidizing and Reducing Agents
HAZARDOUS DECOMPOSITION PRODUCTS: Oxides of Carbon
HAZARDOUS POLYMERIZATION: Will Not Occur

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: Collect with inert absorbent material for disposal. Remove all sources of ignition.

WASTE DISPOSAL METHOD: According to local, State & Federal regulations

SECTION VIII SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION: None Normally Required - Concentration in air determines protection required - NIOSH approved
VENTILATION: LOCAL EXHAUST - N/A MECHANICAL - Acceptable
PROTECTIVE GLOVES: Rubber Gloves Recommended
EYE PROTECTION: Safety Glasses/Goggles
OTHER PROTECTIVE EQUIPMENT: None generally necessary - Observe good hygienic practices

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING & STORING: Do not store above 120F. It is recommended that containers be grounded when pouring. Do not flame cut, braze or weld empty containers (empty, part-full or full). Empty containers are not to be used for storage or shipment of waste of any type. When the use of an empty container for waste is unavoidable, all current local, State and Federal regulations and procedures MUST be followed.

OTHER PRECAUTIONS: Avoid contact with skin, eyes & clothing. Avoid or contain mists & vapors. Persons exposed to mists/vapors should wear approved breathing device. Keep container closed when not in use.

DATE PREPARED: 8/14/86

The information in this MSDS was obtained from sources which we believe are reliable. However, the information is provided without any representation or warranty, expressed or implied, regarding its accuracy or correctness. The conditions or methods of handling, storage, use and disposal of the product are beyond our control and may be beyond our knowledge. Therefore, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of the product.

A. P. GREEN REFRACTORIES CO.

MEXICO, MISSOURI 65265 U.S.A.

MAR 03 1988

CERRO COPPER PRODUCTS COMPANY
MSDS NUMBER -- CCPC-06-0211

MATERIAL SAFETY DATA

A. P. Green Refractories Company
Green Boulevard, Mexico, Missouri 65265
Telephone -- 314-473-3626

SECTION I

PRODUCT NAME: G-20, G-23, R-8023, R-8024
PRODUCT TYPE: Insulating Refractory Bricks or Shapes
CHEMICAL FAMILY: SiO_2 = 54-59%, Al_2O_3 = 33-40% FORMULA: Proprietary
 Fe_2O_3 = 1-2%, Na_2O = 1-2%

SECTION II

PRODUCT HAZARDOUS INGREDIENTS

<u>Chemical</u>	<u>TWA</u>	<u>CAS #</u>
Cristobalite* (SiO_2)	0.05 mg/m ³ ** Respirable Dust	14464-46-1
Quartz* (SiO_2)	0.1 mg/m ³ ** Respirable Dust	14808-60-7

* Not mechanically separate from each other or from other mineralogical phases in product as supplied.

**Source: American Conference of Governmental Industrial Hygienists, 1985-1986.

SECTION III

PHYSICAL DATA

SOLUBILITY IN WATER: None VOLATILES BY VOLUME (%): None
SPECIFIC GRAVITY: 1.6-1.9 MELTING POINT: Not Applicable
APPEARANCE AND ODOR: Buff solid; no odor

MAR 03 1988

SECTION IV

FIRE AND EXPLOSION HAZARD DATA

FLASH POINT: None

EXTINGUISHING MEDIA: Not Combustible

SPECIAL FIRE FIGHTING PROCEDURES: None

UNUSUAL FIRE AND EXPLOSION HAZARDS: None Known

SECTION V

HEALTH HAZARD DATA

EFFECT OF OVEREXPOSURE:

EYES

ACUTE: Dust or chips can cause mechanical irritation.
CHRONIC: None Known

SKIN

ACUTE: Can cause mechanical abrasion or cuts.
CHRONIC: None Known

INHALATION

ACUTE: Dust, if present, may cause upper respiratory irritation.
CHRONIC: Dust may cause lung damage if inhaled on a long-term basis.

INGESTION

ACUTE: Unknown
CHRONIC: Unknown

EMERGENCY AND FIRST AID PROCEDURES:

EYES

Immediately flush with water for 15 minutes. Consult physician if irritation occurs.

SKIN

Treat abrasions or cuts using normal first aid procedures.

INHALATION

Remove to fresh air. Seek medical attention.

INGESTION

Contact physician immediately. Do not induce vomiting unless instructed to do so by physician. Product is not toxic as supplied, but its abrasive nature could damage internal organs.

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UNRECORDED

MAR 03 1988

SECTION VI

REACTIVITY DATA

STABILITY: Stable

INCOMPATIBILITY: None Known

HAZARD POLYMERIZATION: Will Not Occur

SECTION VII

SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: For broken shapes or fragments, sweep, shovel up, or pick up.

WASTE DISPOSAL METHOD: Can be disposed of in an approved landfill, in accordance with local, state, and federal regulations.

SECTION VIII

SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION: Use a NIOSH approved respirator when cutting or when removing this product after service.

VENTILATION: General mechanical ventilation is adequate.

EYE PROTECTION: Goggles or safety glasses with side shields should be worn. Entry of chips into the eyes is a serious hazard, and eye protection should be worn at all times.

OTHER PROTECTION: Use of leather gloves and long-sleeved and long-legged clothing protects hands, arms, and legs from cuts or skin abrasion. Safety shoes should be worn to protect feet from accidentally dropped bricks or shapes.

SECTION IX

SPECIAL PRECAUTIONS

Warning: This product contains crystalline silica. Prolonged exposure to dust may cause silicosis, a progressive pneumoconiosis, or other respiratory diseases. International Agency for Research on Cancer (IARC) has classified crystalline silica as a Class 2A carcinogen. Their study concluded that sufficient evidence for carcinogenicity exists in experimental animals and that limited evidence for carcinogenicity exists in humans.

NIOSH approved respirators should be worn any time that refractories are torn out after service. While some respiratory hazard and/or nuisance dust may exist from the product itself, other foreign substances may warrant additional precautions during tearout and disposal.

This material safety data sheet contains confidential proprietary information and is not to be disclosed to the general public or to competition except as required by law. The information accumulated herein is believed to be accurate but is not warranted to be, whether originating with A. P. Green Refractories or not. This information is offered solely for use in your evaluation of this product in respect to safety, health, and environmental hazards.

Prepared By: Ellis J. Smith
Title: Senior Technical Consultant
Phone: (314) 473-3392

CERRO COPPER PRODUCTS COMPANY
MSDS NUMBER - CCPC-00-0212

APPROVALS:
 ENVIRONMENTAL: _____
 SAFETY: _____
 PURCHASING: _____

Flammability
Rating

Health
Rating

Reactivity
Rating

HAZARD RATING
 Please rate consistent with NFPA Code

MATERIAL SAFETY DATA SHEET

SECTION I NAME AND PRODUCT

MANUFACTURER'S NAME NORTON COMPANY		CONTACT THOMAS Z. RICHARDS
ADDRESS (STREET, CITY, STATE AND ZIP CODE) 1 NEW BOND STREET, WORCESTER, MA 01615-0008		EMERGENCY TELEPHONE NO. 508-795-2690
TRADE NAME, COMMON NAME OR SPECIFICATION RESINOID BONDED GRINDING WHEELS		APPROVED BY <i>K. Marayan</i>
CHEMICAL FAMILY OR PRODUCT TYPE ANY GRADE		DATE 4/30/90

SECTION II COMPOSITION PER 29CFR 1910.1200 (G) (4)

CHEMICAL NAME	MAX %	COMMON NAME	REG* (Y/N)	CAS #	OSHA PERMISSIVE EXPOSURE LIMIT	ACGIH TLV	CARCINOGEN (Y/N)
Alpha-Alumina	90	Alundum, Seeded Gel	Y	1344-28-1	10mg/m ³ (Total Dust)	10mg/m ³ (Total Dust)	N
Silicon Carbide	90	Crystolon	Y	409-21-2	10mg/m ³ (Total Dust)	10mg/m ³ (Total Dust)	N
Zirconia Alumina	90	NZ, ZF, ZS	Y	**NAIF	5mg/m ³ (as Zirconium)	5mg/m ³ (as Zirconium)	N

The grinding wheel may be comprised of 1 or more of the above abrasives. The chemicals listed below may be a part of the bond system.

Fluorides (as F)	3	***N/A	Y	***N/A	2.5mg/m ³	2.5mg/m ³	N
Calcium Oxide	3	Lime	Y	1305-78-8	5mg/m ³	2mg/m ³	N
Glass, Fibrous or Dust	10	Fiberglass	Y	**NAIF	**NAIF	10mg/m ³	N
⁽¹⁾ Silicon Dioxide	<1	Crystalline Silica	Y	14808-60-7	0.1mg/m ³	0.1mg/m ³	Y

*Materials are regulated by OSHA 29 CFR 1910.1200, Hazard Communication Standard, and/or the Massachusetts General Law Chapter 111F, Right To Know Regulations.

⁽¹⁾ Actual grinding tests with wheels known to contain Crystalline Silica did not produce any detectable amount of respirable free Silica.

SECTION III PHYSICAL AND CHEMICAL DATA

BOILING POINT **NAIF	MELTING POINT **NAIF	SPECIFIC GRAVITY 2-4
VAPOR PRESSURE **NAIF	PERCENT VOLATILE BY VOL **NAIF	VAPOR DENSITY **NAIF
EVAPORATION RATE **NAIF	SOLUBILITY IN WATER Slight	SOLUBILITY IN ALCOHOL **NAIF
SOLUBILITY IN OTHER SOLVENT **NAIF		APPEARANCE AND ODOR SOLID PRODUCT: MAY GIVE OFF ODOR IN USE.

SECTION IV SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE - NONE.
 OTHER PRECAUTIONS:

**NAIF

SECTION V CORROSIVITY AND REACTIVITY DATA

STABILITY <input type="checkbox"/> UNSTABLE <input checked="" type="checkbox"/> STABLE	POLYMERIZATION <input type="checkbox"/> MAY OCCUR <input checked="" type="checkbox"/> WILL NOT OCCUR
COMPATIBILITY (MATERIALS TO AVOID)	
DECOMPOSITION PRODUCTS In use, dust and decomposing odors are generated. In most cases, the material removed from the workpiece will be significantly greater than the grinding wheel components. Coolants may produce other decomposition products.	
CONDITIONS TO BE AVOIDED **NAIF	

**NAIF = NO APPLICABLE INFORMATION FOUND

***N/A = NOT APPLICABLE

SECTION VI HEALTH, FIRST AID AND MEDICAL DATA		
PRIMARY ROUTE(S) OF ENTRY	ACUTE AND CHRONIC HEALTH EFFECTS AND EFFECTS OF OVEREXPOSURE	FIRST AID AND MEDICAL INFORMATION
INHALATION (During Grinding)	ACUTE: COUGHING, SHORTNESS OF BREATH. CHRONIC: MAY AFFECT BREATHING CAPACITY.	REMOVE TO FRESH AIR. ARTIFICIAL RESPIRATION AS NEEDED. OBTAIN MEDICAL ASSISTANCE.
INGESTION (During Grinding)	NO KNOWN ADVERSE EFFECTS, BUT INGESTION NOT RECOMMENDED.	OBTAIN MEDICAL ASSISTANCE.
SKIN (During Grinding) CONTACT & ABSORPTION	SOME MAY EXPERIENCE SKIN IRRITATION FROM DUST.	WASH AFFECTED AREAS WITH SOAP AND WATER. OBTAIN MEDICAL ASSISTANCE.
EYE (During Grinding)	DUSTS MAY IRRITATE EYES.	WASH WITH LARGE AMOUNTS OF WATER. OBTAIN FIRST AID AND MEDICAL ASSISTANCE, IF NEEDED.
OTHER POTENTIAL HEALTH RISKS (During Grinding)	GRINDING MAY CREATE ELEVATED SOUND LEVELS WHICH MAY AFFECT HEARING AND MAY AGGRAVATE PREEXISTING RESPIRATORY CONDITIONS.	OBTAIN MEDICAL ASSISTANCE. THERE IS LIMITED INFORMATION THAT CRYSTALLINE SILICA IS A CARCINOGEN.

SECTION VII STORAGE, HANDLING AND USE PROCEDURES	
NORMAL STORAGE AND HANDLING SEE ANSI STANDARD B7.1.	
NORMAL USE HANDLE WITH ADEQUATE VENTILATION. SEE OSHA 29CFR 1910.94 (VENTILATION) and 29CFR1910.1000 (AIR CONTAMINANTS)	
STEPS TO BE TAKEN IN CASE OF LEAKS OR SPILLS. NORMAL CLEANUP PROCEDURES.	
WASTE DISPOSAL METHOD STANDARD LANDFILL METHODS CONSISTENT WITH APPLICABLE FEDERAL, STATE AND LOCAL LAWS. PRODUCTS WITH LISTED FLOURIDES MAY HAVE SLIGHTLY SOLUBLE FLOURIDE SWARF.	

SECTION VIII PERSONAL PROTECTION INFORMATION	
RESPIRATORY PROTECTION (SPECIFY TYPE) AS NEEDED. FOR APPROVED DUST RESPIRATORS SEE OSHA 29CFR 1910.134.	
VENTILATION	LOCAL RECOMMENDED
	MECHANICAL (GENERAL) RECOMMENDED
	OTHER **NAIF
PROTECTIVE GLOVES	AS DESIRED BY USER
EYE PROTECTION	RECOMMENDED SEE OSHA 29CFR 1910.133
OTHER EQUIPMENT	AS NEEDED HEARING PROTECTION SEE OSHA 29CFR 1910.95 (HEARING PROTECTION)
MEASURES TO BE TAKEN DURING REPAIR AND MAINTENANCE OF CONTAMINATED EQUIPMENT THAT HAS BEEN IN CONTACT WITH THIS MATERIAL.	
SEE SECTION VII & VIII	

SECTION IX FIRE AND EXPLOSION HAZARD DATA						
FLASH POINT	**NAIF	METHOD USED	***N/A	FLAMMABLE LIMITS	LEL N/A	UEL ***N/A
EXTINGUISHING MEDIA		USE WATER				
SPECIAL FIRE FIGHTING PROCEDURES		NONE				
EXPLOSION POTENTIAL		**NAIF				

The information and recommendations set forth herein are taken from sources believed to be accurate as of the date hereof; however, Norton Company makes no warranty with respect to the accuracy of the information or the suitability of the recommendations, and assumes no liability to any user thereof.

Form Approved
Budget Bureau No. 44-11387

CERRO COPPER PRODUCTS COMPANY
MSDS NUMBER - CCPC-60-0214

PROSECUTOR, _____

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075	2076	2077	2078	2079	2080	2081	2082	2083	2084	2085	2086	2087	2088	2089	2090	2091	2092	2093	2094	2095	2096	2097	2098	2099	2100	2101	2102	2103	2104	2105	2106	2107	2108	2109	2110	2111	2112	2113	2114	2115	2116	2117	2118	2119	2120	2121	2122	2123	2124	2125	2126	2127	2128	2129	2130	2131	2132	2133	2134	2135	2136	2137	2138	2139	2140	2141	2142	2143	2144	2145	2146	2147	2148	2149	2150	2151	2152	2153	2154	2155	2156	2157	2158	2159	2160	2161	2162	2163	2164	2165	2166	2167	2168	2169	2170	2171	2172	2173	2174	2175	2176	2177	2178	2179	2180	2181	2182	2183	2184	2185	2186	2187	2188	2189	2190	2191	2192	2193	2194	2195	2196	2197	2198	2199	2200	2201	2202	2203	2204	2205	2206	2207	2208	2209	2210	2211	2212	2213	2214	2215	2216	2217	2218	2219	2220	2221	2222	2223	2224	2225	2226	2227	2228	2229	2230	2231	2232	2233	2234	2235	2236	2237	2238	2239	2240	2241	2242	2243	2244	2245	2246	2247	2248	2249	2250	2251	2252	2253	2254	2255	2256	2257	2258	2259	2260	2261	2262	2263	2264	2265	2266	2267	2268	2269	2270	2271	2272	2273	2274	2275	2276	2277	2278	2279	2280	2281	2282	2283	2284	2285	2286	2287	2288	2289	2290	2291	2292	2293	2294	2295	2296	2297	2298	2299	2300	2301	2302	2303	2304	2305	2306	2307	2308	2309	2310	2311	2312	2313	2314	2315	2316	2317	2318	2319	2320	2321	2322	2323	2324	2325	2326	2327	2328	2329	2330	2331	2332	2333	2334	2335	2336	2337	2338	2339	2340	2341	2342	2343	2344	2345	2346	2347	2348	2349	2350	2351	2352	2353	2354	2355	2356	2357	2358	2359	2360	2361	2362	2363	2364	2365	2366	2367	2368	2369	2370	2371	2372	2373	2374	2375	2376	2377	2378	2379	2380	2381	2382	2383	2384	2385	2386	2387	2388	2389	2390	2391	2392	2393	2394	2395	2396	2397	2398	2399	2400	2401	2402	2403	2404	2405	2406	2407	2408	2409	2410	2411	2412	2413	2414	2415	2416	2417	2418	2419	2420	2421	2422	2423	2424	2425	2426	2427	2428	2429	2430	2431	2432	2
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DATE OF BIRTH: -

2016-6143

1 Cutting oil

1	1
1	0

ET

SECTION II HAZARDOUS INGREDIENTS

SECTION III PHYSICAL DATA

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (MIL-STD-1248)	FLAMMABLE LIMITS	Vol	Vol
330°F COC USED		18	68
1211 CHARGING MEDIA			
FOAM DRY CHEMICAL, CO.			
SPECIAL FIRE FIGHTING PROCEDURES			
MATERIAL WILL NOT BURN UNLESS PREHEATED, DO NOT ENTER FIRE-SPACE			
WITHOUT FULL BUNKER GEAR.			
UNUSUAL FIRE AND EXPLOSION HAZARDS			
TREAT AS UNLIT PIPE			

SECTION V. REACTIVITY DATA

STABILITY	UNSTABLE	..	CONDITIONS TO AVOID	AVOID EXCESSIVE HEAT, OPEN
	STABLE	X	FLAMES AND OXIDIZING MATERIAL.	
INCOMPATIBILITY (Materials to avoid)		STRONG OXIDIZING AGENTS		
HAZARDOUS DECOMPOSITION PRODUCTS UPON COMBUSTION: CO ₂				
HAZARDOUS POLYMERIZATION	MAY OCCUR		CONDITIONS TO AVOID	
	WILL NOT OCCUR	X		

SECTION VI HEALTH HAZARD DATA

ROUTE(s) OF ENTRY:	<u>INHALATION?</u>	<u>SKIN?</u>	<u>INGESTION?</u>
	X	X	X
HEALTH HAZARDS (ACUTE & CHRONIC): <u>CAUSES IRRITATION; MAY BE SKIN DEFATTER UPON</u> <u>PROLONGED OR REPEATED CONTACT.</u>			
CARCINOGENICITY:	<u>NTP?</u>	<u>IARC MONOGRAPHS?</u>	<u>OSHA REGULATED?</u>
	NOT LISTED	NOT LISTED	NOT LISTED
SIGNS & SYMPTOMS OF EXPOSURE: <u>OIL MIST INHALATION MAY CAUSE DIZZINESS, NAUSEA,</u> <u>AND DIFFICULTY BREATHING.</u>			
MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE: <u>SENSITIVE DRY SKIN.</u>			
EMERGENCY AND FIRST AID PROCEDURES: <u>IN CASE OF CONTACT, IMMEDIATELY FLUSH EYES</u> <u>WITH PLENTY OF WATER FOR AT LEAST 15 MIN., CALL A PHYSICIAN. WASH SKIN WITH SOAP</u> <u>AND WATER. IF SWALLOWED, DO NOT INDUCE VOMITING. GET MEDICAL ATTENTION. REMOVE</u> <u>FLUID SOAKED CLOTHING AND SHOES. LAUNDRY BEFORE REUSE.</u>			

SECTION VII PRECAUTIONS FOR SAFE HANDLING USE

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: IN CASE OF SPILL, DO NOT USE WATER: SOAK UP WITH SAND, EARTH OR OTHER INERT MATERIAL. PUT IN A SUITABLE CONTAINER. DISPOSE OF IN ACCORDANCE WITH LOCAL, STATE AND FEDERAL REGULATIONS.

WASTE DISPOSAL METHOD: BURY IN AN APPROVED LANDFILL OR INCINERATE IN ACCORDANCE WITH LOCAL, STATE AND FEDERAL REGULATIONS. AVOID CONTAMINATION OF SEWERS AND WATERWAYS.

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING: AVOID CONTACT WITH EYES, SKIN AND CLOTHING. REMOVE CONTAMINATED CLOTHING, LAUNDER BEFORE REUSE. WASH THOROUGH AFTER HANDLING. AVOID BREATHING MIST OR VAPORS.

OTHER PRECAUTIONS: SINCE EMPTIED CONTAINERS RETAIN PRODUCT RESIDUE, FOLLOW LABEL WARNINGS EVEN AFTER CONTAINER IS EMPTIED.

SECTION VIII CONTROL MEASURES

RESPIRATORY PROTECTION (Specify type)

NIOSH APPROVED RESPIRATOR IF EXPOSED TO HOT VAPOR OR MIST

VENTILATION	LOCAL EXHAUST	RECOMMENDED	SPECIAL
	MECHANICAL (General)	N/A	OTHER

PROTECTIVE GLOVES	NEOPRENE OIL IMPERVIOUS
EYE PROTECTION	SAFETY GLASSES OR GOGGLES

OTHER PROTECTIVE EQUIPMENT USE AS REQUIRED TO AVOID SKIN CONTACT.

HYGENIC PRACTICES: WASH AFTER HANDLING.

WE BELIEVE THE STATEMENTS, TECHNICAL INFORMATION AND RECOMMENDATIONS CONTAINED HEREIN ARE RELIABLE, BUT THEY ARE GIVEN WITHOUT WARRANTY OR GUARANTEE OF ANY KIND EXPRESSED OR IMPLIED, AND WE ASSUME NO RESPONSIBILITY FOR ANY LOSS, DAMAGE, OR EXPENSE, DIRECT OR CONSEQUENTIAL, ARISING OUT OF THEIR USE.



GENERAL REFRACTORIES COMPANY

0215
CC EPN: MOORE
CERRO COPPER PRODUCTS COMPANY
MSDS NUMBER - CCPC-00-0015

Customer:

Cerro Copper Products
PO Box 66800
St. Louis, MO 63166

Date: June 28, 1990

(For Sauget, IL)

Dear Customer,

This product contains a toxic chemical or chemicals as listed on MSDS form attached. It is subject to the reporting requirements of section 313-Title-111 of the superfund amendments and reauthorization act of 1986 and 40 CFR Part 372.

Product: Ritex 60 & SK-60

Sincerely Yours
General Refractories Co.

Barney D. Fowler
Manager Personnel & Safety

Notice: This Notification Must not be detached from the MSDS. Any copying and Distribution of this MSDS must include this notification.

MATERIAL SAFETY DATA SHEET

SECTION 1. Product Identification

Manufacturer: General Refractories Co.
Address: 600 Grant St., Room 3000, Pittsburgh, PA 15219
Main Telephone Number: 412-562-6000
Emergency Telephone Number: 215-666-4868
Product Name, Sales Name or Trade Name: RITEX 60
Product Type: Magnesite-Chromite Refractories

SECTION 2. Hazardous Ingredients

Chemical Name	Common Name	CAS Number	Per Cent**	OSHA PEL	ACGIH TLV	Carcinogen (Y/N)*
Ferro- chromite (FeCr2O4)		12737-27-8	<18.0	(1)	(1)	No

Note: (1) Contains Cr(III) which is not listed as hazardous by NIOSH/OSHA. ACGIH TLV for Cr(III) is 0.5 mg/m³. The main ingredient in this product is sinter MgO which is not hazardous.

*Per NTP, IARC or OSHA lists. **On Phase Basis. ***Total Basis.

SECTION 3. Physical Data

Appearance: Brown-black brick shape	Odor: Odorless
Specific Gravity: 3.10-3.25	Melting Point: Over 2200°C
Boiling Point: NI	Vapor Pressure: NI
Evaporation Rate: NI	Solubility in H2O: Insoluble
Solubility in Alcohol: Insoluble	Other Solvents: Strong Acids
Percent Volatile by Vol.: NI	Vapor Density: NI

SECTION 4. Fire and Explosion Hazard Data

Flash Point (Method used): Nonflammable
Flammable Limits: LEL NA UEL NA
Extinguishing Media: NA
Special Fire Fighting Procedures: NA
Unusual Fire and Explosion Hazards: NA

Page 2

SECTION 5. Health Hazard Data

Primary Routes of Entry	Exposure Symptoms	Emergency Procedures
Inhalation	Cough, impaired pulm. func. if exposed to dust	Move to fresh air.
Ingestion	NE	NE
Skin Contact and Absorption	Irritation	Wash with water.
Eyes	Irritation	Flush with water.
Other Potential Health Risks	NE	NE

SECTION 6. Potential Exposure

When	Hazard Form
Installation	Dust generated during mixing.
Removal	Dust from tear-out after service.

SECTION 7. Corrosivity and Reactivity Data

Stability: Stable

Incompatibility (materials to avoid): None

Decomposition Products: None

Conditions to be Avoided: None

SECTION 8. Disposal Procedures

Spill or Leak Procedures: Clean up like any solid material.

Waste Disposal Method: Approved landfill in accordance with all federal,
state and local regulations.

SECTION 9. Personal Protective Equipment/Procedures

Respiratory Protection: Yes

Type: NIOSH/OSHA approved
dust mask.

Ventilation--Local: Yes

Mechanical(General): During handling (cutting of brick
or discharging the bags).

Other: NA

Protective Gloves: Non-porous gloves

Eye Protection: Safety glasses

Other Equipment: Steel toe shoes

Action to be Taken During Repair and Maintenance of Equipment that has
been in Contact with this Product: Use Recommended Safety Equipment.SECTION 10. Special Precautions

During Storage: None

Other: None

SECTION 11. Preparation/Revision
-----Date: 9/16/85

NA=Not Applicable

NI=No Information or Test Data

NE=Not Established



GENERAL REFRACTORIES COMPANY

CERRO COPPER PRODUCTS COMPANY
MSDS NUMBER - CCPC-03-0216

DATE: _____
TIME: _____
BY: _____
FOR: _____

Customer:

Date: June 28, 1990

Cerro Copper Products
PO Box 66800
St. Louis, MO 63166

(For Sauget, IL)

Dear Customer,

This product contains a toxic chemical or chemicals as listed on MSDS form attached. It is subject to the reporting requirements of section 313-Title-111 of the superfund amendments and reauthorization act of 1986 and 40 CFR Part 372.

Product: Ritex CB

Sincerely Yours
General Refractories Co.

Barney D. Fowler
Manager Personnel & Safety

Notice: This Notification Must not be detached from the MSDS. Any copying and Distribution of this MSDS must include this notification.

MATERIAL SAFETY DATA SHEET

SECTION 1. Product Identification

Manufacturer: General Refractories Co.
Address: 600 Grant St., Room 3000, Pittsburgh, PA 15219
Main Telephone Number: 412-562-6000
Emergency Telephone Number: 215-666-4868
Product Name, Sales Name or Trade Name: RITEX CB
Product Type: Magnesite-Chromite Refractories

SECTION 2. Hazardous Ingredients

Chemical Name	Common Name	CAS Number	Per Cent**	OSHA PEL	ACGIH Carcinogen TLV	(Y/N)*
Ferro- chromite (FeCr2O4)		12737-27-8	<30.0	(1)	(1)	No

Note: (1) Contains Cr(III) which is not listed as hazardous by NIOSH/OSHA. ACGIH TLV for Cr(III) is 0.5 mg/m³. The main ingredient in this product is sinter MgO which is not hazardous.

*Per NTP, IARC or OSHA lists. **On Phase Basis. ***Total Basis.

SECTION 3. Physical Data

Appearance: Brown-black brick shape	Odor: Odorless
Specific Gravity: 3.10-3.25	Melting Point: Over 2200°C
Boiling Point: NI	Vapor Pressure: NI
Evaporation Rate: NI	Solubility in H2O: Insoluble
Solubility in Alcohol: Insoluble	Other Solvents: Strong Acids
Percent Volatile by Vol.: NI	Vapor Density: NI

SECTION 4. Fire and Explosion Hazard Data

Flash Point (Method used): Nonflammable
Flammable Limits: LEL NA UEL NA
Extinguishing Media: NA
Special Fire Fighting Procedures: NA
Unusual Fire and Explosion Hazards: NA

Page 2

SECTION 5.

Health Hazard Data

Primary Routes of Entry -----	Exposure Symptoms -----	Emergency Procedures -----
Inhalation	Cough, impaired pulm. func. if exposed to dust	Move to fresh air.
Ingestion	NE	NE
Skin Contact and Absorption	Irritation	Wash with water.
Eyes	Irritation	Flush with water.
Other Potential Health Risks	NE	NE

SECTION 6.

Potential Exposure

When ----	Hazard Form -----
Installation	Dust generated during mixing.
Removal	Dust from tear-out after service.

SECTION 7.

Corrosivity and Reactivity Data

Stability: Stable

Incompatibility (materials to avoid): None

Decomposition Products: None

Conditions to be Avoided: None

SECTION 8.

Disposal Procedures

Spill or Leak Procedures: Clean up like any solid material.

Waste Disposal Method: Approved landfill in accordance with all federal,
state and local regulations.

NE=Not Established



Ryerson

an Inland Steel company

Material Safety Data Sheet

PLASTICS

I. PRODUCT IDENTIFICATION

Distributor: Joseph T. Ryerson & Son, Inc.
Address: 2621 W. 15th Place
Chicago, Illinois 60608
Emergency Telephone: 312/762-2121
Chemical Name and Synonyms: Plastics
Chemical Family: Plastics
Formula: Mixture

II. PRODUCT DESCRIPTION AND HAZARDOUS INGREDIENTS/IDENTITY INFORMATION:

See Chart Inside

III. PHYSICAL DATA

Melting Point F (C): See Chart	Specific Gravity (H₂O = 1): See Chart
Vapor Pressure: Not Applicable	% Volatile by Volume (%): Not Applicable
Vapor Density (Air = 1): Not Applicable	Evaporation Rate: Not Applicable
Solubility in Water: Negligible	
Appearance and Odor: Various colors from white to black, in sheet, plate, bar, structurals, or tubing.	

IV. FIRE AND EXPLOSION HAZARD DATA

Flash Point F (C): Not Applicable	Flammable Limits: Not Applicable
Extinguishing Media: Use methods applicable to surrounding area.	Unusual Fire and Explosion Hazards: None
Special Fire Fighting Procedures: Use self-contained breathing apparatus for protection against degradation products from surrounding materials.	

DISCLAIMER

RYERSON MAKES NO WARRANTIES, EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

The information contained in this Material Safety Data Sheet (MSDS) is believed to be correct, but no representations, guarantees or warranties of any kind are made as to its accuracy, suitability for particular applications, hazards connected with the use of the material or the results to be obtained from the use thereof. User assumes all risk and liability of any use, processing or handling of any material. Variations in methods, conditions, equipment used to store, handle or process the material and hazards connected with the use of the material are solely the responsibility of the user and remain at its sole discretion.

As sold, the product described in this MSDS is considered by Ryerson to be an "article" within the meaning of Title 29 of the Code of Federal Regulations, Section 1910.1200 et seq. This MSDS is intended to be used solely for the purpose of satisfying informational requests made pursuant to that requirement. It is not intended to preempt, replace or expand the terms contained in Ryerson Conditions of Sale. Compliance with all applicable federal, state and local laws and regulations remains the responsibility of the user, and the user has the responsibility to provide a safe workplace, to examine all aspects of its operation, and to determine if or where precautions, in addition to those described herein, are required.

Grade	Specific Gravity	Melting Point °F
Thermosets		
Resin Reinforcement		
Phenolic Cellulose	1.10-1.40	DNM*
Phenolic Glass	1.70-1.90	DNM
Melamine Glass	1.70-1.95	DNM
Silicone Glass	1.55-2.05	DNM
Epoxy Glass	1.65-2.20	DNM
Polyester Glass	1.61-2.00	DNM
Vinylester Glass	1.83	DNM
Polyester FR Glass	1.83	DNM
Thermoplastics		
Nylon 6	1.14-1.18	420
Nylon 6/6	1.14-1.15	490
Acetal	1.34-1.42	350
Polyethylene	0.935-0.996	250
Polypropylene	0.090	32°
Polyvinyl Chloride	1.40-1.44	2
Chlorinated PVC	1.53	23°
Polyurethane	1.25	400
Plasticized PVC	1.2	200
Polyvinylidene Fluoride	1.77	320
Polystyrene	1.05	199-221
ABS	1.04	231-257
Acrylics	1.18	194-221
Fluoroplastics	1.70-2.20	932
Polycarbonate	1.20	302
Polysulfone	1.24	374
Ryton	1.45-1.6	500-675

* = Does Not Melt

Flash
ignition Temp.
°F

Hazardous Products of Combustion

Non-Volatile	Carbon Monoxide — Formaldehyde
Non-Volatile	Carbon Monoxide — Formaldehyde
Non-Volatile	Carbon Monoxide — Formaldehyde
Non-Volatile	Carbon Monoxide
Non-Volatile	Carbon Monoxide — Formaldehyde — Hydrogen Bromide
650	Carbon Monoxide
650	Carbon Monoxide
650	Carbon Monoxide — Hydrogen Bromide
750	Carbon Monoxide — Ammonia
750	Carbon Monoxide — Ammonia
613	Formaldehyde
665	Carbon Monoxide — Carbon Dioxide
830	Carbon Monoxide
735	Carbon Monoxide — Hydrogen Chloride
830	Carbon Monoxide — Hydrogen Chloride
590	Carbon Monoxide — Hydrogen Cyanide
610	Carbon Monoxide — Hydrogen Chloride
600	Carbon Monoxide — Hydrogen Fluoride
None	Carbon Monoxide — Hydrocarbons
490-530	Carbon Dioxide — Carbon Monoxide — Hydrocarbons
	Hydrogen Cyanide — Styrene Acrylonitrile
860	Methyl Methacrylate Monomer
NA	
1050	Hydrofluoric Acid Gas — Perfluorocarbon Olefins
	Bisphenol A Methane Phenol Diphenyl — Carbonate
550°-600°C	Carbon Monoxide — Carbon Dioxide
	Sulfur Dioxide — Hydrocarbons
	None

V. HEALTH HAZARD DATA

Applicable Statutory or Recommended Occupational Exposure Limits: See Section II - Hazardous Ingredients. No TLV exists for plastic products, the hazards associated with plastic are for the individual constituents.

Emergency and First Aid Procedures:

In the event of acute exposure, remove to fresh air, administer oxygen, and seek a physician's assistance.

VI. REACTIVITY DATA

Stability: Considered Stable

Incompatibility: Not incompatible with materials

Hazardous Polymerization: Not Applicable

Hazardous Decomposition Products: See Chart

Conditions to Avoid: When heated to decomposition or combustion temperatures products of decomposition include carbon dioxide, carbon monoxide and other volatiles as indicated.

VII. SPILL OR LEAK PROCEDURES

Steps to be Taken in Case Material is Released or Spilled: Not Applicable

Waste Disposal Method: Approved method of solid waste disposal.

VIII. SPECIAL PROTECTION INFORMATION

When machining thermosetting plastics dry, a dusty condition may result. A suitable dust collection system should be employed along with a dust mask for respiratory protection. A protective cream or clothing should be used to protect skin for worker comfort. When machining any plastics, safety glasses or a face shield should be used.

IX. SPECIAL PRECAUTIONS

Precautions to be Taken in Handling and Storing: Not Applicable

Other Precautions: When fighting fires where plastics are burning a self contained breathing apparatus (SCBA) must be used.

ENVIRONMENTAL:

SAFETY:

PURCHASING:

SECTION I - NAME AND PRODUCT

E.
ALLIED MINERAL PRODUCTS, INC.

ADDRESS:
2700 SCIOTO PARKWAY
COLUMBUS OHIO 43221

PRODUCT NAME:
SCOTT-RAM PLASTIC A94, A97
SCOTT-RAM PLASTER A95

PRODUCT TYPE:
ALUMINUM OXIDE AND CHROMIC OXIDE REFRACTORY

CONTACT:
KENNETH E. WEST
EMERGENCY TELEPHONE NUMBER:
(614)876-0244

TELEPHONE NUMBER FOR INFORMATION:
(614)876-0244

DATE PREPARED:
MAY 18, 1990

SECTION II - REGULATED INGREDIENTS *

CHEMICAL NAME	CAS#	WEIGHT PERCENT RANGE	OSHA EXPOSURE LIMIT	ACGIH TLV	CARCINOGEN Y/N
ALUMINUM OXIDE	1344-28-1	30-50	10 mg/m ³	10 mg/m ³	N
PHOSPHORIC ACID	7664-38-2	0-10	1 mg/m ³	1 mg/m ³	N
ALUMINUM SILICATE	1302-76-7	30-50	15 mg/m ³	10 mg/m ³	N
SILICA (QUARTZ)	14808-60-7	0-5	0.1 mg/m ³ TWA	0.1 mg/m ³	Y
ALUMINUM SILICATE	1302-78-9	0-5	15 mg/m ³	10 mg/m ³	N
CHROMIC OXIDE	1306-38-9	0-10	0.5mg/m ³	0.5 mg/m ³	Y

REGULATED AS PER LISTS : OSHA 29CFR 1910, SUBPART Z; ACGIH, HHS/NTP; & IARC.

SECTION III - PHYSICAL AND CHEMICAL DATA

BOILING POINT: N/A
VAPOR PRESSURE: N/A
EVAPORATION RATE: N/A

MELTING POINT: 3500 F
PERCENT VOLATILE BY VOL: N/A
SOLUBILITY IN WATER: <6.0%

SPECIFIC GRAVITY: 3.16
VAPOR DENSITY: N/A
SOLUBILITY IN ALCOHOL: <6.0%

SOLUBILITY IN OTHER SOLVENTS:
N/A

APPEARANCE AND ODOR:
GREEN PLASTIC MIX - ACID ODOR

.....
SECTION IV - FIRE AND EXPLOSION HAZARD DATA
.....

FLASH POINT: N/A (METHOD USED): N/A FLAMMABLE LIMITS:
EXTINGUISHING MEDIA: N/A LEL: N/A UEL: N/A
SPECIAL FIRE FIGHTING PROCEDURES: N/A
EXPLOSION POTENTIAL: N/A

.....
SECTION V - HEALTH, FIRST AID AND MEDICAL TREATMENT
.....

ROUTE(S) OF ENTRY:

INHALATION:

HEALTH HAZARDS (ACUTE and CHRONIC):
REPEATED INHALATION OF RESPIRABLE DUST FOR EXTENDED PERIOD OF TIME MAY CAUSE PERMANENT LUNG INJURY (SILICOSIS).

EMERGENCY AND FIRST AID PROCEDURES:
REMOVE TO FRESH AIR.

INGESTION:

HEALTH HAZARDS (ACUTE and CHRONIC):
IRRITANT

EMERGENCY AND FIRST AID PROCEDURES:
DRINK PLENTY OF WATER. CONSULT A PHYSICIAN.

SKIN:

HEALTH HAZARDS (ACUTE and CHRONIC):
IRRITANT

EMERGENCY AND FIRST AID PROCEDURES:
WASH WITH PLENTY OF WATER.

EYE:

HEALTH HAZARDS (ACUTE and CHRONIC):
IRRITANT

EMERGENCY AND FIRST AID PROCEDURES:
FLUSH IMMEDIATELY AND REPEATEDLY WITH WATER AND CONSULT A PHYSICIAN.

OTHER POTENTIAL HEALTH RISKS:

HEALTH HAZARDS (ACUTE and CHRONIC):
EXPOSURE TO HEXAVALENT CHROMIUM COMPOUNDS MAY CAUSE CANCER (REFER TO SECTION VI).
THE INTERNATIONAL AGENCY FOR RESEARCH ON CANCER (IARC) HAS CLASSIFIED SILICA AND
SOME SILICATES AS POTENTIAL CARCINOGENS (GROUP 2A CARCINOGENS).

EMERGENCY AND FIRST AID PROCEDURES:
REMOVE TO FRESH AIR OR WASH WITH PLENTY OF WATER IN CASE OF SKIN CONTACT. MINIMIZE
EXPOSURE AND CONSULT A PHYSICIAN.

.....
SECTION VI - REACTIVITY DATA
.....

STABILITY:

UNSTABLE: STABLE: X

HAZARDOUS POLYMERIZATION:

WILL OCCUR: WILL NOT OCCUR: X

INCOMPATIBILITY (MATERIALS TO AVOID):

N/A

DECOMPOSITION PRODUCTS:

HIGH TEMPERATURE REACTION BETWEEN CHROMIUM OXIDE (Cr_2O_3) AND CERTAIN OTHER MATERIALS CAN RESULT IN HEXAVALENT CHROMIUM COMPOUNDS. GROUP I (Li, Na, K, ETC.) AND GROUP II (Ca, Mg, ETC.) COMPOUNDS CAN REACT WITH CHROMIUM OXIDE TO FORM HEXAVALENT CHROMIUM COMPOUNDS. HEXAVALENT CHROMIUM COMPOUNDS ARE CARCINOGENIC. AFTER EXPOSURE TO TEMPERATURES ABOVE 1600 F, CRISTOBALITE AND TRIDYKITE ARE FORMED WHICH HAVE A TLV THAT IS HALF OF QUARTZ.

CONDITIONS TO BE AVOIDED:

N/A

.....
SECTION VII - STORAGE, HANDLING AND USE PROCEDURES
.....

NORMAL STORAGE AND HANDLING:

STORE IN A COOL LOCATION. EXCESSIVE HEAT WILL DRY THE PRODUCT AND RENDER IT UNUSABLE.

NORMAL USE:

WEAR RUBBER GLOVES AND SAFETY GOGGLES TO PROTECT FROM THE IRRITATING EFFECTS OF PHOSPHORIC ACID. WEAR APPROVED RESPIRATOR DURING THE REMOVAL OF THE PRODUCT. DO NOT BREATHE DUST.

STEPS TO BE TAKEN IN CASE OF LEAKS OR SPILLS:

CLEAN UP. RETURN TO PACKAGE IF NOT CONTAMINATED.

WASTE DISPOSAL METHOD:

UNUSED PRODUCT - DISPOSE IN ACCORDANCE WITH FEDERAL, STATE AND LOCAL REGULATIONS.
USED PRODUCT - IF HEXAVALENT CHROMIUM IS DETECTABLE IN USED PRODUCT, IT MAY BE CONSIDERED A HAZARDOUS WASTE THAT SHOULD BE DISPOSED OF ACCORDINGLY.

.....
SECTION VIII - PERSONAL PROTECTION INFORMATION
.....

RESPIRATORY PROTECTION:

AS SPECIFIED IN OSHA STD. 29CFR 1910.134

VENTILATION:

LOCAL:

RECOMMENDED

MECHANICAL:

RECOMMEND DUST COLLECTOR AND OTHER CONTROLS TO REDUCE DUST EXPOSURE.

OTHER:

N/A

PROTECTIVE CLOVES:

RUBBER CLOVES

EYE PROTECTION:

SAFETY GOGGLES

OTHER PROTECTIVE CLOTHING AND EQUIPMENT:

PROTECTIVE CLOTHING DURING REMOVAL TO AVOID SKIN CONTACT.

MEASURES TO TAKE DURING REPAIR/MAINTENANCE OF EQUIPMENT IN CONTACT WITH THIS PRODUCT:

AVOID BREATHING DUST. WEAR APPROVED RESPIRATOR.

.....
SECTION IX - SPECIAL PRECAUTIONS
.....

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE:

PRACTICE GOOD HOUSEKEEPING. POST AREAS. INSIST EMPLOYEES WEAR APPROVED RESPIRATORS.

OTHER PRECAUTIONS:

RECOMMEND YEARLY CHEST X-RAYS AND VITAL CAPACITY TESTS FOR EMPLOYEES REGULARLY EXPOSED TO SILICA FOR EARLY DETECTION OF SILICOSIS. COMPLY WITH ALL GUIDELINES FOR CRYSTALLINE SILICA EXPOSURE. THE IARC HAS CLASSIFIED SILICA AND SOME SILICATES AS GROUP 2A CARCINOGENS; I.E., CHEMICAL FOR WHICH THERE IS CONSIDERED TO BE SUFFICIENT EVIDENCE OF CARCINOGENICITY IN EXPERIMENTAL ANIMALS, AND AT LEAST LIMITED EVIDENCE OF CARCINOGENICITY IN HUMANS.

STEAM SPALLING, WHICH CAN LEAD TO PERSONAL INJURY, MAY RESULT FROM IMPROPER DRYING AND FIRING PROCEDURES. FOR SAFEST USE AND OPTIMUM PERFORMANCE, PROPER PRACTICES MUST BE FOLLOWED.

THIS PRODUCT CONTAINS CHROMIC OXIDE, A CHROMIUM COMPOUND WHICH IS A TOXIC CHEMICAL SUBJECT TO REPORTING REQUIREMENTS OF SARA TITLE III, SECTION 313. CHROMIUM COMPOUNDS DO NOT HAVE A CAS NUMBER. WEIGHT RANGE PERCENT CAN BE FOUND IN SECTION II. THIS PRODUCT CONTAINS PHOSPHORIC ACID WHICH IS A TOXIC CHEMICAL SUBJECT TO REPORTING REQUIREMENTS OF SARA TITLE III, SECTION 313. CAS #7664-38-2. WEIGHT RANGE PERCENT CAN BE FOUND IN SECTION II.

**NAIF = NO APPLICABLE INFORMATION FOUND

**N/A = NOT APPLICABLE



SHELL OIL COMPANY
SHELL CHEMICAL COMPANY
SHELL DEVELOPMENT COMPANY
SHELL PIPE LINE CORPORATION

MSDS 7660-1

HAZARD
RATING



Shell Sol 140

MATERIAL SAFETY DATA SHEET

Information on this form is furnished solely for the purpose of compliance with the requirements of the Federal Hazardous Substances Act, and is not to be used for any other purpose. Use or dissemination of all or any part of this information without the express written permission of the Shell Oil Company is prohibited.

CCPCO CHEMICAL PRODUCTS COMPANY
MSDS NUMBER - CCPCO-00-0020

NOT
ORIG.

ENVIRONMENTAL: _____
SAFETY: _____
PURCHASING: _____

SEC		EMERGENCY TELEPHONE NO. 713-473-9461	
MANUFACTURER'S NAME Shell Chemical Company			
ADDRESS (Number, Street, City, State, and ZIP Code) One Shell Plaza, Box 2463, Houston, Texas 77001			
CHEMICAL NAME AND SYNONYMS		TRADE NAME Shell Sol 140	
CHEMICAL FAMILY Hydrocarbon		FORMULA	

SECTION II HAZARDOUS INGREDIENTS*

COMPOSITION	%	SPECIES	LD ₅₀		LC ₅₀	
			ORAL	DERMAL	CONCENTRATION	HOURS
Solvents	100	Rat	>10 ml/kg		>700 ppm	4
		Rabbit		>2.0 ml/kg		

SECTION III PHYSICAL DATA

BOILING POINT (°F)	375-408	SPECIFIC GRAVITY (H ₂ O=1) @ 60°F	0.786
VAPOR PRESSURE (mmHg) @ 100°F	1	PERCENT VOLATILE BY VOLUME (%)	
VAPOR DENSITY (AIR=1)	5.3	EVAPORATION RATE (n-BuAc = 1)	0.03
SOLUBILITY IN WATER	Negligible		
APPEARANCE AND ODOR	Light colored liquid with hydrocarbon odor		

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (Method used) Tag Closed Cup = 141°F	FLAMMABLE LIMITS	Lel	Uel
		1.0	6.0
EXTINGUISHING MEDIA Exclude air - use foam, CO ₂ , steam, water-fog, dry chemicals			
SPECIAL FIRE FIGHTING PROCEDURES Do not use water, exclude air, consult local fire marshal			
UNUSUAL FIRE AND EXPLOSION HAZARDS			
Handle as a combustible material			

SECTION V HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE 175 ppm (calculated)

EFFECTS OF OVEREXPOSURE
Anesthesia - headache, nausea, dizziness, etc. Liquid mildly to moderately irritating to skin and eyes.

EMERGENCY AND FIRST AID PROCEDURES

Remove victim and restore breathing if required. Remove from skin and with soap and water. Flush eyes with water for at least 15 minutes.

SECTION VI REACTIVITY DATA

STABILITY

UNSTABLE

STABLE

CONDITIONS TO AVOID

Open flame and sparks

X

INCOMPATIBILITY (Materials to avoid)

Not applicable

HAZARDOUS DECOMPOSITION PRODUCTS

CO, CO₂ when combustedHAZARDOUS
POLYMERIZATION

MAY OCCUR

WILL NOT OCCUR

CONDITIONS TO AVOID

X

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

Avoid open flame or spark sources. Provide adequate ventilation.

WASTE DISPOSAL METHOD

Evaporate or flush with water to an open, well-ventilated area. Use oil sewer if available. Remove to container.

SECTION VIII SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION (Specify type)

Organic canister mask or air pack as required

VENTILATION

LOCAL EXHAUST

Desirable

SPECIAL

MECHANICAL (General)

With approved Class D explosion-proof motors and switches

OTHER

PROTECTIVE GLOVES

Normally not required

EYE PROTECTION

Conventional eye cover to guard against unexpected splashing

OTHER PROTECTIVE EQUIPMENT

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING

Avoid excessive heat.

Avoid open flames and spark sources. Avoid splash-filling. Provide adequate ventilation.

OTHER PRECAUTIONS

NAME D. M. Sheets

TITLE Supervisor - Reg Aff - Chem Prods

COMPANY Shell Chemical Company

SIGNATURE *D. M. Sheets*

DATE June 1974

THE INFORMATION CONTAINED HEREIN IS BASED ON DATA CONSIDERED ACCURATE HOWEVER NO WARRANTY IS EXPRESSED OR IMPLIED REGARDING THE ACCURACY OF THESE DATA OR THE RESULTS TO BE OBTAINED FROM THE USE THEREOF.

VENDOR ASSUMES NO RESPONSIBILITY FOR INJURY TO VENDOR OR THIRD PERSONS PROBABLY CAUSED BY THE MATERIAL IF REASONABLE SAFETY PROCEDURES ARE NOT ADHERED TO AS STIPULATED IN THE DATA SHEET. ADDITIONALLY VENDOR ASSUMES NO RESPONSIBILITY FOR INJURY TO VENDOR OR THIRD PERSONS PROBABLY CAUSED BY ABNORMAL USE OF THE MATERIAL EVEN IF REASONABLE SAFETY PROCEDURES ARE FOLLOWED. FURTHERMORE VENDOR ASSUMES THE RISK IN HIS USE OF THE MATERIAL.

SILICA SAND

NPCA HMIS CODE

Health Hazard	3
Flammability	
Hazard	0
Reactivity	
Hazard	0
Maximum Personal Protection	E

CERRO COPPER PRODUCTS COMPANY
MSDS NUMBER - CCPC-00-0221

MATERIAL SAFETY

ENVIRONMENTAL: (PRIOR)
SAFETY: (PRIOR)
PURCHASING: (PRIOR)

SECTION I MATERIAL IDENTIFICATION

Manufacturer's Name OTTAWA INDUSTRIAL SAND COMPANY Telephone No. 815/434-0188
Address (Number, Street, City, State, Zip Code) P. O. Box 577, Ottawa, IL 61350
Chemical Name and Synonyms Silicone Dioxide; Crystalline Silica
Chemical Family Chemical Abstract Number Formula Number
Extracted Inorganic Material CAS 01-4808-60-7 SiO₂
Trade Name and Synonyms

FRAC SAND-2040; 2050; 3050; 4060
Silurian Filtration Sand
FLINT SHOT-2.4; 2.6; 2.8; 3.0; 4.0
MELT-Standard; Fine; Extra Fine
SPECIAL BLEND-Coarse; Medium; Fine
F-70; 75; 80; 95; 105; 115; 125; 140

SIL-CO-SIL #270; #290; #295; #390; #395; #398; #400
Silicon Carbide Sand
Sand Mill Media
ASTM-C-109; 190
Cracked Grain
AFS 50/70
Engine Sand

Crystal
Federal Fine
#17 Silica
Special Bond
Bond
Flint Silica
Sawing Sand

SECTION II CHEMICAL AND PHYSICAL PROPERTIES

Molecular Wt. N/A Boiling Point 4046°F Melting Point 3050°F Specific Gravity (Water = 1) or Bulk Density N/A
Odor/Appearance White, granular, crushed or ground-like flour - No odor

SECTION III FLAMMABILITY AND EXPLOSIVE PROPERTIES

No fire or explosion hazard. Sand may be used to smother fire.

SECTION IV COMPOSITION

Crystalline Silica (quartz) CAS 01-4808-60-7 ranges from $\geq 49.5\%$ to $\leq 99.8\%$ total product composition. Remainder is nonhazardous ingredients.

SECTION V HEALTH HAZARD DATA

Permissible Exposure Limits

Threshold Limit Value 10 mg/M³

% Respirable quartz + 2

Prolonged overexposure to Crystalline Free Silica Dust above the Threshold Limit Value specified above may cause scarring of the lungs with cough and shortness of breath. A delayed lung injury, silicosis, may result from breathing free silica. Silicosis is a form of disabling, progressive and sometimes fatal pulmonary fibrosis characterized by the presence of typical nodulation in the lungs.

Emergency and First Aid Procedures

EYES: Wash eyes with large amounts of water. Obtain medical attention if irritation persists.

SECTION VI REACTIVITY DATA

Stability Unstable ☐ Conditions to Avoid NONE
Stable ☒

Incompatibility (Materials to Avoid) Endothermic - Dissolved by Hydrofluoric Acid (HF)

Hazardous Decomposition Products NONE

Hazardous Polymerization May Occur ☐ Conditions to Avoid NONE
Will Not Occur ☒

SECTION VII ENVIRONMENTAL HAZARD - SPILL OR LEAK PROCEDURES

Persons not wearing protective equipment as noted in Section VIII should be restricted from areas of spills or releases until cleanup has been completed. If Crystalline free silica is spilled or released, the following steps should be taken:

Waste Disposal Method: Collect spilled material in the most convenient dustless, safe, manner. Crystalline free silica may be reused or disposed of in an unrestricted sanitary landfill.

SECTION VIII SPECIAL PROTECTION INFORMATION

Respiratory Protection Good industrial hygiene practices recommend that engineering controls be used to reduce environmental concentrations to the permissible exposure level. However, there are some exceptions where respirators may be used to control exposure. Respirators may be used when engineering and work practice controls are not technically feasible, when such controls are in the process of being installed, or when they fail and need to be supplemented. If the use of respirators is necessary, the only respirators permitted are those that have been approved by the Mine Safety and Health Administration (formerly Mining Enforcement and Safety Administration) or by the National Institute for Occupational Safety and Health.

In addition to respirator selection, a complete respiratory protection program should be instituted which includes regular training, maintenance, inspection, cleaning and evaluation.

The chart below indicates the minimum respiratory protection required given a known exposure.

RESPIRATORY PROTECTION FOR CRYSTALLINE SILICA
(From September, 1978 Occupational Health Guideline
for Crystalline Silica, U.S. Department of Labor,
U.S. Department of Health and Human Services, et.al.)

CONDITION	MINIMUM RESPIRATORY PROTECTION* REQUIRED ABOVE X**mg/m ³
Particulate Concentration 5X** mg/m ³ or less	Any dust respirator
10X** mg/m ³ or less	Any dust respirator, except single-use or quarter-mask respirator. Any fume respirator or high efficiency particulate filter respirator. Any supplied-air respirator. Any self-contained breathing apparatus.
50X** mg/m ³ or less	A high efficiency particulate filter respirator with a full facepiece. Any supplied-air respirator with a full facepiece, helmet or hood. Any self-contained breathing apparatus with a full facepiece.
500X** mg/m ³ or less	A powered air-purifying respirator with a high efficiency particulate filter. A Type C supplied-air respirator operated in pressure-demand or other positive pressure or continuous-flow mode.
Greater than 500X**mg/m ³ or entry and escape from unknown concentrations	Self-contained breathing apparatus with a full facepiece operated in pressure-demand or other positive pressure mode. A combination respirator which includes a Type C supplied-air respirator with a full facepiece operated in pressure-demand or other positive pressure or continuous-flow mode and an auxiliary self-contained breathing apparatus operated in pressure-demand or other positive pressure mode.
Fire Fighting	Self-contained breathing apparatus with a full facepiece operated in pressure-demand or other positive pressure mode.

*Only NIOSH-approved or MSHA-approved equipment should be used.

** X indicates the permissible exposure as defined above.

SAFETY GLASSES AND GLOVES ARE OPTIONAL, DEPENDING ON PRODUCT USAGE.

SECTION IX SHIPPING REGULATIONS FOR HAZARDOUS MATERIAL

Crystalline Silica (quartz) is not D.O.T. regulated.

SECTION X SPECIAL PRECAUTION & CONCLUSION

Precautions to be taken in handling and storage. Use dustless or wet systems when handling and clean-up so that exposure does not exceed Threshold Limit Value in Section V above. Other precautions. Practice good housekeeping, maintain ventilation system and post appropriate warning notices where product is used, stored and handled. Employees likely to be exposed to potentially hazardous crystalline silica levels should receive pre-employment and periodic medical examinations in order to determine any pre-existing physical conditions which may place the exposed employee at increased risk, and to establish a baseline for future health monitoring. Examination of the respiratory and cardiovascular system should be stressed.

Prepared By

William D. Darrow

William D. Darrow

Title

Corporate Safety & Personnel
Supervisor

Date

11/19/1985



MATERIAL SAFETY DATA SHEET

CERRO COPPER PRODUCTS COMPANY
MDS NUMBER - COPS-00-0225

I. MATERIAL IDENTIFICATION

Name: Soluble Oil
Conoco Product Code: 7931
Synonyms: Soluble Oil - Cutting Fluid
Chemical Family: Petroleum Hydrocarbon
Manufacturer: Conoco Inc.
Address: P.O. Box 1267, Ponca City, OK 74603

CAS Registry No.: Mixture
Transportation Emergency No.:
(800) 424-9300 (Chemtrec)
Product Information No.:
(405) 767-6000

II. HAZARDOUS INGREDIENTS

HAZARD DATA

Hazard Determination:

Health Effect Properties:
Hydrocarbon/Oil Mist.

Potential respiratory toxicity.

Physical Effect Properties:
Product/Mixture: None.

Not applicable.

III. PHYSICAL DATA

Appearance and Odor:	<u>Brown liquid; mild petroleum hydrocarbon odor.</u>		
Boiling Range (°F)	<u>650-1000</u>	Specific Gravity (H ₂ O=1)	<u>0.90</u>
Vapor Pressure (mmHg)	<u>Nil</u>	% Volatile (by volume)	<u>Nil</u>
Vapor Density (Air=1)	<u>NA</u>	Evaporation Rate (Ether=1)	<u>Nil</u>
Solubility in Water	<u>Emulsifies 100% with water</u>		

IV. REACTIVITY DATA

Stable: X

Unstable:

Hazardous Decomposition Products: Normal combustion forms carbon dioxide
incomplete combustion may produce carbon monoxide.

Conditions To Avoid: Strong oxidizing materials, heat, flame.

Hazardous Polymerization: Will not occur.

V. FIRE AND EXPLOSION HAZARD DATA

Flash Point (Method used): 295° F (PM) Autoignition Temperature: 680° F

Handle and store in accordance with NFPA procedure for Class III B Combustible Liquid.

Extinguishing Media: Use water spray, dry chemical, foam, or carbon dioxide.

Special Fire Fighting Procedures: Water or foam may cause frothing. Use water to keep fire-exposed containers cool. Water spray may be used to flush spills away from exposures.

Unusual Fire and Explosion Hazards: Products of combustion may contain carbon monoxide, carbon dioxide, and other toxic materials. Do not enter enclosed or confined space without proper protective equipment including respiratory protection.

Soluble Oil is normally used in concentrations of 10% or less in water, therefore, in normal use it is not combustible.

National Fire Protection Agency (NFPA) CLASSIFICATION

Health 0 Fire 1 Reactivity 0

Least - 0

HAZARD RATING

Slight - 1

Moderate - 2

High - 3

Extreme - 4

VI. TRANSPORTATION AND STORAGE

DOT HAZARD CLASS: Not Applicable

Precautions To Be Taken In Handling And Storing: Product is Class III B Combustible Liquid per NFPA Code No. 30-1984. Store and handle accordingly.

Shipping Paper Description: Not D.O.T. Regulated.

Placard: Not D.O.T. Regulated.

D.O.T. Label: Not Regulated.

OSHA Label: CAUTION: Minimize exposure. Inhalation of concentrations of oil mist may cause irritation of the respiratory tract. Use in well-ventilated area.

VII. HEALTH HAZARD INFORMATION

PEL 5 mg/m³ * TLV 5 mg/m³ * Ceiling Value Not Established AEL 5 mg/m³ *

* This value refers to airborne mists of petroleum-based cutting oils or white mineral oils.

Primary Route(s) of Exposure/Entry: Skin, inhalation.

Signs and Symptoms of Exposure/Medical Conditions Aggravated By Exposure:

No adverse health effect has been identified specifically for this product. Health effect information from animal and human studies has been included on related materials, even though health experts may disagree as to the significance of this data.

VII. HEALTH HAZARD INFORMATION (continued)

Mouse skin painting studies have shown that highly solvent-refined petroleum distillates having a boiling point below 700° F, and which are similar to ingredients in this product, have not caused skin tumors.

Similar substances can cause irritation to eyes, lungs, or skin after prolonged or repeated exposure. Overexposure may cause central nervous system depression.

Listed as Carcinogen or Potential Carcinogen by: NTP No IARC No OSHA No

VIII. EMERGENCY AND FIRST AID PROCEDURES

Eyes: Immediately wash with fresh water for at least 15 minutes and get medical attention.

Skin: Remove contaminated clothing as soon as possible. Wash exposed skin thoroughly with soap and water. If irritation persists, consult a physician.

Laundry contaminated clothing before reuse. Extremely contaminated leather shoes should be discarded.

If exposed to hot oil, immediately cool with cold water. Do not attempt to remove oil but continue to cool exposed areas with cold packs and seek medical assistance immediately.

Inhalation: If overexposure occurs, remove individual to fresh air. If breathing stops, administer artificial respiration.

Ingestion: If this material is swallowed, do not induce vomiting. If vomiting begins, lower victim's head in an effort to prevent vomitus from entering lungs. Immediately consult a physician. Do not attempt to give liquid to an unconscious person.

Note to Physicians: Gastric lavage by qualified medical personnel may be considered, depending on quantity of material ingested.

IX. SPILL, LEAK AND DISPOSAL PROCEDURES

RCRA HAZARDOUS WASTE: Yes _____ No X

In Case Of Spill Or Leak: Contain spill immediately in smallest area possible. Recover as much of the product itself as possible by such methods as vacuuming, followed by soaking up residual fluids by use of absorbent materials. Remove contaminated items including solids and place in proper container for disposal. Avoid washing, draining, or directing material to storm or sanitary sewers.

IX. SPILL, LEAK AND DISPOSAL PROCEDURES (Continued)

Waste Disposal Method: Recycle as much of the recoverable product as possible.
Dispose of nonrecyclable material by such methods as controlled incineration,
complying with federal, state and local regulations.

X. PRECAUTIONARY MEASURES

Respiratory Protection: None required except under unusual circumstances such as
described in Section V.

Ventilation: Normal shop ventilation.

Protective Gloves: Impervious to protect against chronic skin contact.

Eye Protection: Safety glasses with side shields.

Other Precautions: Skin contact should be minimized. Complete protective
clothing if material is being handled hot. Launder or discard contaminated
clothing. Discard contaminated leather material.

The above data is based on tests and experience which Conoco believes reliable
and are supplied for informational purposes only. CONOCO DISCLAIMS ANY LIABILITY
FOR DAMAGE OR INJURY WHICH RESULTS FROM THE USE OF THE ABOVE DATA AND NOTHING
CONTAINED THEREIN SHALL CONSTITUTE A GUARANTEE, WARRANTY (INCLUDING WARRANTY
OF MERCHANTABILITY) OR REPRESENTATION (INCLUDING FREEDOM FROM PATENT LIABILITY)
BY CONOCO WITH RESPECT TO THE DATA, THE PRODUCT DESCRIBED, OR THEIR USE FOR
ANY SPECIFIC PURPOSE, EVEN IF THAT PURPOSE IS KNOWN TO CONOCO.



KERR-MCGEE REFINING CORP.

TRIANGLE REFINERIES DIVISION

3020 KNIGHT STREET • SUITE 100 • SHREVEPORT, LOUISIANA 71105 • TELEPHONE (800) 548-3417 (318) 661-0954

KERR-COPPER PRODUCTS COMPANY

MSDS NUMBER - CCPC-00-0224

APPROVALS

ENVIRONMENTAL (PRIOR)

SAFETY (PRIOR)

PURCHASING (PRIOR)

G.S. ROBBINS

MATERIAL SAFETY DATA SHEET

MSDS NUMBER

CV-1426

EMERGENCY TELEPHONE

713/831-4700

800/424-9300

I. PRODUCT IDENTIFICATION

KERMAC 140 Flash Naphtha, Rule 66

Medium Aliphatic Solvent Naphtha

Petroleum Hydrocarbon Naphtha

C₁₀-C₁₂

NATIONAL FIRE PROTECTION ASSOCIATION HAZARD RATING CODES

Flash - 0
Moderate - 2

Slight - 1
High - 3

Extreme - 4

HEALTH CODE

0

FIRE CODE

2

REACTIVITY CODE

0

II SUMMARY OF HAZARDS

CAUTION! COMBUSTIBLE LIQUID AND VAPOR. HARMFUL IF INHALED AND MAY CAUSE DELAYED LUNG INJURY. CAN CAUSE CENTRAL NERVOUS SYSTEM DEPRESSION. ASPIRATION HAZARD IF SWALLOWED - CAN ENTER LUNGS AND CAUSE DAMAGE. Keep away from heat and flame. Avoid breathing vapor. Use ventilation adequate to keep vapor below recommended exposure limits. Avoid contact with eyes, skin and clothing. Wash thoroughly after handling.

DOT Hazardous Material

Yes ☒ No ☐

DOT SHIPPING NAME AND NUMBER

Petroleum naphtha UN 1255

DOT HAZARD CLASS

Combustible liquid

III. HAZARDOUS COMPONENTS

INGREDIENT	% RANGE	REL. TLV	HAZARD
Medium Aliphatic Solvent Naphtha (CAS #64742-88-7)	100	Stoddard Solvent TWA-100 ppm	Combustible Acute Health Chronic Health

IV. HEALTH INFORMATION

EXPOSURE BY
ROUTE OF ENTRY

EXPOSURE CHARACTERISTICS AND FIRST AID

INHALATION	EFFECTS	Acute: headache, nasal and respiratory irritation, nausea, drowsiness, breathlessness, fatigue, central nervous system depression, convulsions, and loss of consciousness.
	FIRST AID	Move exposed person to fresh air. If breathing has stopped, perform artificial respiration. Get medical attention as soon as possible.
SKIN	EFFECTS	Acute: irritation Chronic: dermatitis
	FIRST AID	If clothing soaked, immediately remove clothing and wash skin with soap and water. Launder clothing before wearing. Get medical attention promptly.
EYES	EFFECTS	Acute: irritation
	FIRST AID	Immediately flush eyes with water for a minimum of 15 minutes, occasionally lifting the lower and upper lids. Get medical attention promptly.
SWALLOWING INGESTION	EFFECTS	Acute: aspiration hazard, headache, nausea, drowsiness, fatigue, pneumonitis, pulmonary edema, central nervous system depression, convulsions and loss of consciousness.
	FIRST AID	Call a physician immediately, ONLY induce vomiting at the instruction of a physician. Never give anything by mouth to an unconscious person.

Medical Conditions Generally
Aggravated by Exposure

N/AV

LISTED AS POTENTIAL CARCINOGEN
OR CARCINOGEN

NOT LISTED ☒
INTERNATIONAL AGENCY FOR RESEARCH ON CANCER

NATIONAL TOXICOLOGY PROGRAM ☐
OSHA ☐

V. EMPLOYEE PROTECTION

RESPIRATORY PROTECTION: UTILIZE NIOSH APPROVED RESPIRATORS REFER TO MANUFACTURER'S PROTECTION FACTORS AND OSHA STANDARD 1910.134 AS A GUIDELINE.

Up to 1000 ppm, half-mask organic vapor respirator. Up to 5000 ppm, full-face organic vapor respirator or full-face supplied air respirator. Greater than 5000 ppm, fire fighting, or unknown concentration, self-contained breathing apparatus with positive pressure

EYE

Safety glasses, chemical goggles or face shield, as appropriate.

SKIN

Gloves: Nitrile, neoprene or other material resistant to naphtha.

MAINTAIN local or dilution ventilation to keep air concentration below 100 ppm. Loading, unloading, tank gauging, etc. remain upwind. Request assistance of safety and industrial hygiene personnel to determine air concentrations.

VI. FIRE PROTECTION INFORMATION

FLASH POINT AND METHOD	AUTOIGNITION TEMPERATURE	FLAMMABLE LIMITS % VOLUME IN AIR	LOWER	UPPER
Tag Closed Cup 148°F	450°F		1	6
EXTINGUISHING MEDIA Carbon dioxide, dry chemical, or foam. Water stream may spread fire, use water spray only to cool containers exposed to fire. If leak or spill has not ignited, use water spray to disperse the vapors.				
HAZARDOUS DECOMPOSITION PRODUCTS Incomplete combustion can yield carbon monoxide and various hydrocarbons.				
FIRE AND EXPLOSION HAZARDS Can form combustible mixtures with air when heated.				
STORAGE Do not store with strong oxidizers. Store as OSHA Class III A combustible liquid.				
HAZARDOUS POLYMERIZATION WILL NOT OCCUR <input checked="" type="checkbox"/> MAY OCCUR <input type="checkbox"/>		STABILITY STABLE <input checked="" type="checkbox"/> UNSTABLE <input type="checkbox"/>		

VII. PHYSICAL AND CHEMICAL PROPERTIES

BOILING POINT	VAPOR PRESSURE	EVAPORATION (ETHYL ETHER = 1)
360-410°F	Reid V.P. 0.1	Estimated 8 Times Slower
PERCENT VOLATILE BY VOLUME (%)	MOLECULAR WEIGHT	APPEARANCE
100	159	Clear Liquid
LEAK AND THRESHOLD	DROP POINT	VAPOR DENSITY (AIR = 1)
Petroleum Naphtha Approx. 1 ppm	N/A	5.5
SPECIFIC GRAVITY (WAT = 1)	VISCOSITY	SOLUBILITY (G/1000 WATER AT 20 °C)
0.78	1.32 cSt @ 100°F	Negligible

VIII. ENVIRONMENTAL PROTECTION

SPILLS	Notify emergency response personnel. Evacuate area and remove ignition sources. Build dike to contain flow. Remove free liquid, do not flush to sewer or open water. Pick up with inert absorbent and place in closed container for disposal.		
WASTE DISPOSAL	EPA Hazardous Waste	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	EPA Waste Code Number N/A
			Waste Characteristic or Hazard Code N/A
Utilize licensed waste disposal company. Consider recycling or incineration. Utilize permitted hazardous waste disposal site.			
ADDITIONAL INFORMATION			

PREPARED BY <i>C. L. Russell</i>	DATE PREPARED <i>12-22-88</i>
-------------------------------------	----------------------------------

DISCLAIMER

The information and recommendations contained in this publication have been compiled from sources believed to be reliable and to represent the best current opinion on the subject at the time of publication. Since we cannot anticipate or control the many different conditions under which this information or our products may be used, we make no guarantee that the recommendations will be adequate for all individuals or situations. Each user of the product described herein should determine the suitability of the described product for his particular purpose and should comply with all federal and state rules and regulations concerning the described product.

ABBREVIATIONS	
CAS #	Chemical Abstracts Service Number
N/A	Not Applicable
N/AV	Not Available
ppm	Parts per million
PEL	Permissible Exposure Limit
TLV	Threshold Limit Value
	Both the OSHA PEL and the American Conference of Governmental Industrial Hygienists TLV were reviewed. Where a difference existed, the more restrictive of the two was selected.
STEL	Short Term Exposure Limit
TWA	Time-Weighted Average

**TRIANGLE REFINERIES, Inc.**

SPECIALTY PRODUCTS DIVISION

3020 KNIGHT STREET • SUITE 130 • SHREVEPORT, LOUISIANA 71105

TELEPHONE (800) 548-3417

(318) 861-0954

LEADS COPPER PRODUCTS COMPANY

MSDS NUMBER - CCPC-00-0224

APPROVALS:

ENVIRONMENTAL

SAFETY

REGULATORY

PRICE

DATE

MATERIAL SAFETY DATA SHEET

MSDS NUMBER

CV-1426

EMERGENCY TELEPHONE

COMPANY

405/270-2526

CHEMTREC

800/424-9300

I. PRODUCT IDENTIFICATION

PRODUCT KERMAC 140 Flash Naphtha, Rule 66		CHEMICAL NAME Medium Aliphatic Solvent Naphtha	
CHEMICAL FAMILY Petroleum Hydrocarbon Naphtha		FORMULA C ₁₀ -C ₁₂	CAS NUMBER 64742-88-7
NATIONAL FIRE PROTECTION ASSOCIATION HAZARD RATING CODES Least - 0 Slight - 1 Moderate - 2 High - 3 Extreme - 4		HEALTH CODE 0	FIRE CODE 2
			REACTIVITY CODE 0

II. HAZARDOUS COMPONENTS

INGREDIENT	%	OSHA LIMIT	TLV
140 Flash Naphtha	100	Similar to Stoddard Solvent TWA-500 ppm	Similar to Stoddard Solvent TWA-100 ppm STEL-200 ppm

III. PHYSICAL AND CHEMICAL PROPERTIES

BOILING POINT 360-410°F	VAPOR PRESSURE <2.3 mmHg @ 100°F	EVAPORATION (ETHYL ETHER = 1) Estimated 8
PERCENT VOLATILE BY VOLUME (%) 100	MOLECULAR WEIGHT 158	APPEARANCE Clear Liquid
ODOR AND THRESHOLD Petroleum Naphtha-Approx. 1 ppm	MELTING POINT Not Available	VAPOR DENSITY (AIR = 1) 5.5
SPECIFIC GRAVITY (H ₂ O = 1) 0.77	VISCOSITY <32 SUS @ 100°F	SOLUBILITY (G/100G WATER AT 20°C) Negligible

IV. FIRE PROTECTION INFORMATION

FLASH POINT AND METHOD Tag Closed Cup 143°F	AUTOIGNITION TEMPERATURE 450°F	FLAMMABLE LIMITS % VOLUME IN AIR	LOWER 1	UPPER 6
EXTINGUISHING MEDIA				

Carbon dioxide, dry chemical, or foam. Water stream may spread fire, use water spray only to cool containers exposed to fire. If leak or spill has not ignited, use water spray to disperse the vapors.

HAZARDOUS DECOMPOSITION PRODUCTS

Incomplete combustion can yield carbon monoxide and various hydrocarbons.

FIRE AND EXPLOSION HAZARDS

Can form combustible mixtures with air when heated to approximately 143°F. Will not flash spontaneously.

HAZARDOUS POLYMERIZATION

☒ Will Not Occur

☐ May Occur

STABILITY

☒ Stable

☐ Unstable

V. HEALTH INFORMATION

INHALATION

Possible effects include headache, nasal and respiratory irritation, nausea, drowsiness, fatigue, pneumonitis, pulmonary edema, central nervous system depression.

EYE CONTACT

Irritation

SKIN CONTACT

Irritation, may cause dermatitis due to defatting of keratin layer.

INGESTION

Possible effects include headache, drowsiness, nausea, fatigue, pneumonitis, pulmonary edema, central nervous system depression. Aspiration hazard.

REPORTED AS POTENTIAL CARCINOGEN
OR CARCINOGEN

☒ Not Applicable

☐ International Agency for Research on Cancer

☐ National Toxicology Program

☐ OSHA

VI. FIRST AID PROCEDURES

INHALATION

Move exposed person to fresh air. If breathing has stopped, perform artificial respiration. Get medical attention as soon as possible.

EYE CONTACT

Immediately flush eyes with water for a minimum of 15 minutes, occasionally lifting the lower and upper lids. Get medical attention as soon as possible.

SKIN CONTACT

If clothing soaked, immediately remove clothing and wash skin with soap and water. Launder clothing before wearing. Get medical attention promptly.

INGESTION

Do not induce vomiting. Get medical attention as soon as possible.

VII. EMPLOYEE PROTECTION

RESPIRATORY PROTECTION (UTILIZE NIOSH APPROVED RESPIRATORS. REFER TO MANUFACTURER'S PROTECTION FACTORS AND OSHA STANDARD 1910.134, AS A GUIDELINE.)

Up to 500 ppm, half-mask organic vapor respirator.

Up to 1000 ppm, full-face organic vapor respirator or full-face supplied air respirator.

Greater than 1000 ppm, fire fighting, or unknown concentration, self-contained breathing apparatus with positive pressure.

PROTECTIVE CLOTHING	EYE	Chemical goggles, face shield.
	SKIN	Gloves: Nitrile, neoprene or other material resistant to naphtha solvent.

VENTILATION

Maintain local or dilution ventilation to keep air concentration below 100 ppm. Loading, unloading, tank gauging, etc. remain upwind. Request assistance of safety and industrial hygiene personnel to determine air concentrations.

VIII. TRANSPORTATION AND STORAGE INFORMATION

DOT Hazardous Material ☒ Yes ☐ No
 DOT SHIPPING NAME AND NUMBER Petroleum naphtha UN 1255 DOT HAZARD CLASS Combustible liquid

STORAGE

Do not store with strong oxidizers. Store as OSHA Class IIIA combustible liquid.

IX. ENVIRONMENTAL PROTECTION

SPILLS

Notify emergency response personnel. Evacuate area and remove ignition sources. Build dike to contain flow. Remove free liquid, do not flush to sewer or open water. Pick up with inert absorbent and place in closed container for disposal.

WASTE DISPOSAL

EPA Hazardous Waste ☐ Yes ☒ No
 EPA WASTE CODE NUMBER Not Applicable WASTE CHARACTERISTIC OR HAZARD CODE Not Applicable

Utilize licensed waste disposal company. Consider recycling or incineration. Utilize permitted hazardous waste disposal site.

MANAGER'S SIGNATURE (PRODUCT SAFETY AND COMPLIANCE)

Prepared by Kerr-McGee Refining Corporation for Triangle Refineries, Inc.

C. L. Russell

DATE PREPARED

5-15-85

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MATERIAL HEALTH AND SAFETY BULLETIN

Union Chemicals Division

Petrochemical Group

Cerro Copper Products Company
MSDS NUMBER - CCPC-00-0225

Solvent 140 66/3

1	2
0	

No.: 858
Product Code No.: 1106

UN No. 1256

MANUFACTURER'S NAME

Union Chemicals Division, Union Oil Company of California

STREET ADDRESS

1345 North Meacham Road

CITY, STATE, AND ZIP CODE

Schaumburg, Illinois 60196

Business Phone: (312) 885-5450

EMERGENCY TELEPHONE NO.

Transportation Emergencies call CHEMTREC (800) 424-9300
Health Emergencies Call Los Angeles Poison Control Center (24 hours) (213) 664-2121

PRODUCT: 140 Solvent 66/3
COMMON NAME: AMSCO Solv 1106
GENERIC NAME: Volatile Solvent
CHEMICAL NAME: Not Applicable
HEMICAL FAMILY: Hydrocarbon Mixture
DOT PROPER SHIPPING NAME:

Not Applicable

WARNING STATEMENT:

Caution Combustible.
DO NOT induce vomiting if swallowed.
For industrial use only.

Section I - - INGREDIENTS

	TLV*		TLV*
140 Solvent	37		

*Threshold Limit Value

A, OSHA ☐

B, ACGIH ☐

C. See Section III ☐

D, Other ☒

Suggested - Carnegie-Mellon

Section II - - EMERGENCY AND FIRST AID PROCEDURES

EMERGENCY: Have a physician call LOS ANGELES POISON CONTROL CENTER (24 hrs.) 213/664-2121

Eye Contact	If this product comes in contact with the eyes, flush with large quantities of water for at least 15 minutes and seek immediate medical attention.
Skin Contact	If this product comes in contact with the skin, wash with soap and large quantities of water. Seek medical attention if irritation from contact persists.
Inhalation	If breathing difficulties, dizziness, or lightheadedness occur when working in areas with high vapor concentrations, victim should seek air free of vapors. If victim experiences continued breathing difficulties, administer oxygen until medical assistance can be rendered. If breathing stops, begin artificial respiration and seek immediate medical attention.
Ingestion	If this product is swallowed, DO NOT induce vomiting. Seek immediate medical advice and/or attention.

Section III - - PHYSIOLOGICAL EFFECTS AND HEALTH INFORMATION

Eye Effects	This product may be an eye irritant.
Skin Effects	This product may cause skin irritation upon prolonged or repeated contact.
Systemic Effects	Various studies have shown a possible association with exposure to this product and the following: Respiratory tract irritation. Narcosis in high concentration.

Section IV - - SPECIAL PROTECTION INFORMATION

Respiratory Protection (Specify Type)	The use of respiratory protection depends on vapor concentration above the time-weighted TLV; use a NIOSH approved cartridge respirator or gas mask.		
Ventilation	General mechanical ventilation may be sufficient to keep product vapor concentrations within specified time-weighted TLV ranges. If general ventilation proves inadequate to maintain safe vapor concentrations, supplemental local exhaust may be required. Other special precautions such as respiratory masks or environmental containment devices may be required in extreme cases.		
Protective Gloves	The use of impermeable gloves is advised to prevent skin irritation in sensitive individuals.	Eye Protection	Safety glasses, chemical goggles and/or face shields are recommended to safeguard against potential eye contact, irritation, or injury.
Other Protective Equipment	Impermeable aprons are advised when working with this product. The availability of eye washes and safety showers in work areas is recommended.		

Section V - - REACTIVITY DATA

Stability	Unstable		Conditions to Avoid:
	Stable	X	
Incompatibility (Materials to Avoid)	This product is incompatible with strong oxidizing agents strong acids or bases selected amines		
Hazardous Decomposition Products	Thermal decomposition in the presence of air may yield carbon monoxide and/or carbon dioxide		
Hazardous Polymerization	May Occur		Conditions to Avoid:
	Will Not Occur	X	

Section VI - - SPILL OR LEAK PROCEDURES

HIGHWAY OR RAILWAY SPILLS - CALL CHEMTREC 800/424-9300

Precautions In Case of Release or Spill	Keep sources of ignition and hot metal surfaces isolated from the spill. Flush spilled material into suitable retaining areas or containers with large quantities of water. Small amounts of spilled material may be absorbed into an appropriate absorbant.
Reportable Quantity	Notify Coast Guard National Response Center; Phone No. 800-424-8802, If Spill Is Greater Than <u> </u> lbs (Kilograms)
Waste Disposal Method	Dispose of <u> </u> product in accordance with applicable local, county, state and federal regulations.

Section VII - - STORAGE AND SPECIAL PRECAUTIONS

Handling and Storing Precautions	Keep product containers cool, dry, and away from sources of ignition. Use and store this product with adequate ventilation. (See Section IV.)
Other Precautions	Personnel should avoid inhalation of vapors. (See sections I, II, III, V, VI) Personal contact with the product should be avoided. Should contact be made, remove saturated clothing and flush affected areas with water. (See sections II, IV, VI)

Section VIII - - FIRE AND EXPLOSION HAZARD DATA

DOT Flammability Classification	Combustible Liquid	Flash Point Range: <input type="checkbox"/> Below 20° F, <input type="checkbox"/> 20° F - 100° F <input checked="" type="checkbox"/> 100° F - 200° F <input type="checkbox"/> Over 200° F <input type="checkbox"/> None to boiling
Extinguishing Media	Use foam, CO ₂ or dry chemical fire fighting apparatus.	
Unusual Fire and Explosion Hazards	Keep work areas free of hot metal surfaces and other sources of ignition.	
Fire Fighting Procedures	The use of self-contained breathing apparatus is recommended for fire fighters. Water may be unsuitable as an extinguishing media, but helpful in keeping adjacent containers cool. Avoid spreading burning liquid with water used for cooling purposes.	

Section IX - - PHYSICAL DATA

Approximate Boiling Range, ° F	367° - 405° F	Vapor Density: <input checked="" type="checkbox"/> Heavier Than Air <input type="checkbox"/> Lighter
Evaporation Rate: <input type="checkbox"/> Faster Than Ether <input checked="" type="checkbox"/> Slower	Percent Volatile: 100%	Solubility in Water: Negligible
Specific Gravity: <input checked="" type="checkbox"/> Lighter Than Water <input type="checkbox"/> Heavier	Weight per Gallon: 6.50	
Appearance and Odor:	This product is clear, has little if any color and has a characteristic odor.	

Section X - - DOCUMENTARY INFORMATION

Product Code No. 1106	Issue Date 10/20/80	Prepared By Paul Pfeifer
Replaces: UCD No. 252	Product Code No. 1106	Issued 12/79
Reviewed By: <i>A. Jettin</i>	Manager, Loss Prevention	
Reviewed By: <i>Quinn, Beck</i>	Director of Occupational Health & Toxicology	
Reviewed By: <i>Harold A. King</i>	Science and Technology Division	

The above information is believed to be correct as of the date hereof. However, no warranty of merchantability, fitness for any use or any other warranty is expressed or is to be implied regarding the accuracy of these data, the results to be obtained from the use of the material, or the hazards connected with such use. Since the information contained herein may be applied under conditions beyond our control and with which we may be unfamiliar, and since data made available subsequent to the date hereof may suggest modification of the information, we do not assume responsibility for the results of its use. This information is furnished on the condition that the person receiving it shall make his own determination as to the suitability of the material for his particular purpose and on the condition that he assume the risk of his use thereof.

MATERIAL SAFETY DATA SHEET

PETROLITE CORPORATION
369 MARSHALL AVE.
ST. LOUIS MO 63119 U.S.A

REVISION DATE: 07/06/89
EMERGENCY PHONE: 1-314-961-3500
CHEMTREC EMER NO: 1-800-424-9300

SECTION 1 PRODUCT IDENTIFICATION

PRODUCT: SPC2470

TRADE NAME: SPECTRUM

LABEL: 000

REPLACES

097

VB-5160

SHIPPING NAME: NOT HAZARDOUS PER D.O.T. CFR TITLE 49

CHEMICAL DESCRIPTION

5-CHLORO-2-METHYL-4-ISOTHIAZOLIN-3-ONE, 2-METHYL-4-ISOTHIAZOLIN-3-ONE IN WATER.

SECTION 2 HAZARDOUS INGREDIENTS

CAS NUMBER	MATERIAL	%	EXPOSURE LIMITS
26172-55-4	5-chloro-2-methyl-4-isothiazolin-3-one	1.15	RECOM. 0.1 mg/M3
02682-20-4	2-methyl-4-isothiazolin-3-one	.35	Not Established

SECTION 3 PHYSICAL DATA

SPECIFIC GRAVITY(H2O = 1.0@60 F): 1.026

VOLATILITY: N/A

VAPOR PRESSURE: Not Established

SOL. IN WATER: Soluble

MISC. DATA: pH = 3 - 5

APPEARANCE AND ODOR: Pale yellow to green liquid. Mild aromatic odor.

SECTION 4 FIRE AND EXPLOSION HAZARD DATA

FLASH POINT: >200 F

FLAMMABLE LIMITS: Not Established

FLASH METHOD:

EXTINGUISHING MEDIA:

Use water spray or fog, alcohol-type foam, dry chemical or CO2.

FIRE FIGHTING PROCEDURES:

Use a self-contained breathing apparatus with full facepiece operated in pressure-demand or other positive pressure mode. Non-flammable. Keep fire-exposed containers cool using water spray.

UNUSUAL FIRE AND EXPLOSION HAZARDS:

None known.

CONTINUED ON PAGE: 2

MATERIAL SAFETY DATA SHEET

PAGE 2

***CONTINUATION OF SPC2470 ***

SECTION 5 HEALTH HAZARD DATA

EFFECTS OF OVEREXPOSURE:

INHALATION:

Inhalation of mists, aerosols or very high vapor concentrations will produce intense eye, nose and respiratory irritation and may result in lung damage. Prolonged exposure may result in chemical pneumonitis and, in extreme cases, pulmonary edema.

INHALATION LC50: >13.7 mg/L (Rat)

MATERIAL SAFETY DATA SHEET

PAGE 3

***CONTINUATION OF SPC2470 ***

SECTION 6 REACTIVITY DATA

STABILITY:

Stable under normal conditions of storage and use.

INCOMPATIBILITY:

Keep away from strong oxidizing agents.

HAZARDOUS DECOMPOSITION PRODUCTS:

Oxides of sulfur and nitrogen. HCl.

HAZARDOUS POLYMERIZATION:

Will not occur.

SECTION 7 SPILL AND LEAK PROCEDURES

IF MATERIAL IS SPILLED OR RELEASED:

Dike and absorb spill using hypochlorite solution* in combination with inert material (dry sand, earth etc.) and transfer to suitable containers for disposal.

*Recommended formulation: 8 lbs. calcium hypochlorite (HTH 65% active ingredient), 5 lbs. sodium hydroxide 50% and 77 lbs. water. Sodium hydroxide must be added to maintain alkalinity and prevent the evolution of chlorine gas.

DISPOSAL METHOD:

This product is a registered industrial antimicrobial product. Please refer to product label for disposal instructions.

DECONTAMINATION PROCEDURES:

Not appropriate.

SECTION 8 SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION:

When ventilation is not adequate, use of a NIOSH-approved dust, mist and fume respirator is recommended. In emergency situations, the use of a self-contained breathing unit may be necessary.

VENTILATION:

General ventilation should be provided to maintain ambient concentrations below nuisance levels. Local ventilation of emission sources may be necessary.

CONTINUED ON PAGE: 4

MATERIAL SAFETY DATA SHEET

PAGE 4

***CONTINUATION OF SPC2470 ***

PROTECTIVE CLOTHING:

Chemical-resistant gloves and chemical goggles, face shield and synthetic apron or coveralls should be used to prevent contact with eyes, skin or clothing.

SECTION 9 SPECIAL PRECAUTIONS

Avoid breathing of vapors and contact with eyes, skin or clothing. Hazardous product residue may remain in emptied container. Do not reuse container without commercial cleaning or reconditioning.

This product is a registered industrial antimicrobial product. Please refer to the product label for drum cleaning instructions.

Although the information and recommendations set forth herein are believed to be correct as of the date hereof, Petrolite makes no representations to the accuracy of such information and recommendations. It is the user's responsibility to determine the suitability and completeness of such information and recommendation for its own particular use. Petrolite shall not be responsible for any direct, indirect, incidental or consequential damages of whatsoever nature resulting from the publication, use of or reliance upon such information and recommendations.

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ENVIRONMENTAL DATA SHEET

PAGE 1

PETROLITE CORPORATION
369 MARSHALL AVE.
ST. LOUIS MO 63119 U.S.A.

REVISION DATE: 08/26/91
EMERGENCY PHONE: 1-314-961-3500
CHEMTREC EMER NO: 1-800-424-9300

SPC2470

SARA TITLE III, SECTION 313

This notification is incorporated into the Material Safety Data Sheet (MSDS) for the Petrolite product named above. When physically attached to the MSDS, this notification must not be detached from the MSDS. Any copying and redistribution of the MSDS to which this notification is attached must include copying and redistribution of this notification.

This Petrolite product contains no toxic chemicals subject to the reporting requirements of section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR 372 in excess of the applicable de minimis concentration.

CARPENTER TECHNOLOGY CORPORATION

MATFRIAL



GENERAL OFFICES:

P.O. BOX 14662

READING, PA 19612-4662

CERRO COPPER PRODUCTS COMPANY
MSDS NUMBER - CCPC-00-0229ENVIRONMENTAL:
SAFETY:

CERRO COPPER PRODUCTS
DIV CERRO CORP
P.O. BOX 681
EAST ST LOUIS IL 62202

WHILE THE INFORMATION SET FORTH ON THIS MATERIAL SAFETY DATA SHEET IS BELIEVED TO BE ACCURATE, AS OF THE REVISION DATE, CARPENTER TECHNOLOGY CORPORATION MAKES NO WARRANTY WITH RESPECT THERETO AND DISCLAIMS ALL LIABILITY FROM RELIANCE THEREON. NO WARRANTY, EITHER EXPRESS OR IMPLIED OF MERCHANTABILITY OR FITNESS OR OF ANY NATURE WITH RESPECT TO THE MATERIAL OR DATA HEREIN IS MADE HEREUNDER.

FOR ADDITIONAL INFORMATION, PLEASE CONTACT THE HEALTH AND SAFETY DEPARTMENT AT: 215-371-2000.

SECTION I - PRODUCT IDENTIFICATION

PRODUCT DESCRIPTION:

CARPENTER STAINLESS TYPE 304 PROJECT 70

DARK BLUE PAINT

SECTION II - HAZARDOUS INGREDIENTS

INGREDIENTS	%	PEL / TLV 8 HOUR TWA UNLESS OTHERWISE NOTED	
		PEL	TLV
IRON * 1309-37-1	71.00	PEL 10.0 MG/M3	TLV 5.0 MG/M3
CHROMIUM 7440-47-3	18.20	PEL 1.0 MG/M3	TLV 0.5 MG/M3
NICKEL 7440-02-0	8.20	PEL 1.0 MG/M3	TLV 1.0 MG/M3
MANGANESE 7439-96-5	1.70	PEL 0.5 MG/M3	TLV 0.5 MG/M3 (DUST) 1.0 MG/M3 (FUME) 3.0 MG/M3 STEL(FUME)
COBALT 7440-48-4	.70	PEL 0.1 MG/M3	TLV 0.1 MG/M3
COPPER 7440-50-8	.70	PEL 0.1 MG/M3 (FUME) 1.0 MG/M3 (DUST/MIST)	TLV 0.2 MG/M3 (FUME) 1.0 MG/M3 (DUST/MIST)
NIYBDENUM 7439-98-7	.70	PEL 15.0 MG/M3 (INSOLUBLE COMPOUNDS)	TLV 10.0 MG/M3 (INSOLUBLE COMPOUNDS)

* - THESE SUBSTANCES ARE REGULATED IN THEIR OXIDE FORM

THE ABOVE PERCENT CONCENTRATIONS ARE CONSIDERED NOMINAL AND ARE PROVIDED FOR INDUSTRIAL HYGIENE PURPOSES.
THEY DO NOT REPRESENT A CERTIFICATION OF CONTENT.

SECTION III - PHYSICAL DATA

BOILING PT.: HIGH
MELTING PT.: 2400 to 2800 F
SPECIFIC GRAVITY: 7.5 to 8.5
VAPOR PRESSURE: NIL

VAPOR DENSITY: NIL
SOLUBILITY IN WATER: INSOLUBLE
APPEARANCE AND ODOR: SOLID,
ODORLESS METAL

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

UNLESS OTHERWISE NOTED, NONE. PRODUCT IS A SOLID METAL.
NOTES:

SECTION V - HEALTH HAZARD DATA

SPECIALTY STEEL ALLOYS ARE GENERALLY NOT CONSIDERED HAZARDOUS IN THE FORM SHIPPED (SOLID BARS, BILLETS, RODS, WIRE, ETC.). HOWEVER, IF YOUR PROCESS INVOLVES GRINDING, MELTING, WELDING, CUTTING, OR ANY OTHER PROCESS THAT CAUSES A RELEASE OF DUST OR FUME, HAZARDOUS LEVELS OF DUST OR FUME OF THE CONSTITUENTS OF THESE ALLOYS COULD BE GENERATED. THE FOLLOWING IS A LIST OF POTENTIAL HEALTH EFFECTS FOR ALL HAZARDOUS ELEMENTS THAT ARE POSSIBLY CONTAINED IN ANY OF OUR ALLOYS. PLEASE REFER TO SECTION II TITLED "HAZARDOUS INGREDIENTS" FOR A LIST OF THOSE SPECIFIC ELEMENTS CONTAINED IN THIS PARTICULAR ALLOY.

HEALTH EFFECTS:

*ALUMINUM: METAL DUST AND OXIDE IS GENERALLY CONSIDERED A "NUISANCE" PARTICULATE. MAY CAUSE IRRITATION OF THE EYES, NOSE, AND THROAT IN EXCESSIVE CONCENTRATIONS.

*BERYLLIUM: CAN CAUSE DERMATITIS, ALSO CAUSES A SEVERE CHRONIC LUNG DISEASE KNOWN AS "CHRONIC BERYLLIUM DISEASE" WHICH IS OFTEN FATAL.

*IRON OXIDE: HAS CAUSED IRRITATION OF THE EYES, NOSE, AND SKIN OF EXPERIMENTAL ANIMALS. IT MAY HAVE THE SAME EFFECT ON HUMANS.

*CHROMIUM: FERROCHROME ALLOYS HAVE BEEN ASSOCIATED WITH LUNG CHANGES IN WORKERS EXPOSED TO THESE ALLOYS.

*COBALT: FUME OR DUST CAUSES IRRITATION OF THE NOSE AND THROAT AND MAY CAUSE AN ALLERGIC SKIN RASH. ALSO HAS BEEN REPORTED TO CAUSE RESPIRATORY DISEASE WITH SYMPTOMS RANGING FROM COUGH AND SHORTNESS OF BREATH TO PERMANENT DISABILITY AND DEATH. THE SYMPTOMS FREQUENTLY GO AWAY WHEN EXPOSURE HAS STOPPED, BUT SOMETIMES THE SYMPTOMS PROGRESS AFTER EXPOSURE HAS CEASED.

*COLUMBIUM (NIOBIUM): IS EXPECTED TO HAVE SIMILAR EFFECTS TO TANTALUM.

*COPPER: FUME OR DUST CAUSES IRRITATION OF THE EYES, NOSE, AND THROAT AND A FLU-LIKE ILLNESS CALLED METAL FUME FEVER. SYMPTOMS INCLUDE FEVER, MUSCLE ACHES, NAUSEA, CHILLS, DRY THROAT, COUGH, WEAKNESS, AND SWEET OR METALLIC TASTE IN THE MOUTH.

SECTION V - HEALTH HAZARD DATA (CONTINUED)

HAFNIUM: HAFNIUM SALTS HAVE CAUSED IRRITATION OF THE EYES AND SKIN IN EXPERIMENTAL ANIMALS. OTHER HAFNIUM COMPOUNDS HAVE CAUSED LIVER DAMAGE IN ANIMALS ON PROLONGED FEEDING.

IRON OXIDE: REPEATED EXPOSURE TO IRON OXIDE FUME OVER A PERIOD OF YEARS MAY CAUSE X-RAY CHANGES OF THE LUNGS, BUT DOES NOT CAUSE THE EXPOSED PERSON TO BECOME ILL.

MANGANESE: INHALATION OF MANGANESE FUME MAY CAUSE "METAL FUME FEVER" WITH SYMPTOMS OF CHILLS, FEVER, NAUSEA, COUGH, DRY THROAT, WEAKNESS, MUSCLE ACHES, AND A SWEET OR METALLIC TASTE IN THE MOUTH. PROLONGED OR REPEATED EXPOSURE MAY AFFECT THE NERVOUS SYSTEM, WITH DIFFICULTY IN WALKING AND BALANCING, WEAKNESS OR CRAMPS IN THE LEGS, HOARSENESS OF THE VOICE, TROUBLE WITH MEMORY OR JUDGEMENT, UNSTABLE EMOTIONS OR UNUSUAL IRRITABILITY. THE RESPIRATORY SYSTEM MAY ALSO BE AFFECTED BY A PNEUMONIA LIKE ILLNESS WITH SYMPTOMS OF COUGHING, FEVER, CHILLS, BODY ACHES, CHEST PAIN AND OTHER COMMON SIGNS OF PNEUMONIA.

MOLYBDENUM: OXIDES OF MOLYBDENUM HAVE CAUSED IRRITATION OF THE EYES, NOSE, AND THROAT, WEIGHT LOSS, AND DIGESTIVE DISTURBANCES IN EXPERIMENTAL ANIMALS.

NICKEL: FUMES ARE RESPIRATORY IRRITANTS AND MAY CAUSE RESPIRATORY DISEASE. SKIN CONTACT CAN ALSO CAUSE AN ALLERGIC SKIN RASH. NICKEL AND ITS COMPOUNDS HAVE BEEN REPORTED TO CAUSE CANCER OF THE LUNGS AND SINUSES.

TANTALUM: GENERALLY CONSIDERED TO HAVE A LOW ORDER OF TOXICITY BUT HAS PRODUCED TRANSIENT LESIONS OF THE LUNGS IN EXPERIMENTAL ANIMALS.

TIN: GENERALLY CONSIDERED TO EXHIBIT A LOW ORDER OF TOXICITY. MAY CAUSE IRRITATION OF THE EYES, NOSE, THROAT AND SKIN.

TITANIUM DIOXIDE: CONSIDERED TO BE A "NUISANCE" PARTICULATE. CAN CAUSE IRRITATION OF THE EYES, NOSE, AND THROAT IN HIGH CONCENTRATIONS. SLIGHT LUNG CHANGES MAY OCCUR.

* **TUNGSTEN:** METAL AND INSOLUBLE COMPOUNDS ARE GENERALLY CONSIDERED TO HAVE A LOW ORDER OF TOXICITY, BUT HAVE PRODUCED LUNG CHANGES IN EXPERIMENTAL ANIMALS.

VANADIUM PENTOXIDE: DUST AND FUME MAY CAUSE IRRITATION OF THE EYES, NOSE, THROAT, AND RESPIRATORY TRACT. IT MAY ALSO CAUSE BRONCHITIS WITH WHEEZING AND CHEST PAIN. A GREENISH DISCOLORATION OF THE TONGUE MAY OCCUR. AFTER SYMPTOMS HAVE OCCURRED FOLLOWING INITIAL EXPOSURE, REPEATED EXPOSURE MAY CAUSE MORE SEVERE SYMPTOMS OF THE SAME NATURE. REPEATED EXPOSURES MAY CAUSE CHRONIC BRONCHITIS, OR ALLERGIC SKIN RASH.

ZIRCONIUM: GENERALLY CONSIDERED TO HAVE A LOW ORDER OF TOXICITY. SKIN RASH HAS BEEN REPORTED FROM EXPOSURE TO ZIRCONIUM CONTAINING DEODORANTS.

REFERENCES: HEALTH HAZARD DATA FOR THE ELEMENTS MARKED WITH AN (*) WAS TAKEN FROM ACGIH'S DOCUMENTATION OF TLV'S. HEALTH HAZARD DATA FOR THE REMAINING ELEMENTS WAS TAKEN FROM THE NIOSH / OSHA OCCUPATIONAL HEALTH GUIDELINES FOR CHEMICAL HAZARDS. FOR ADDITIONAL SOURCES OF INFORMATION ON POTENTIAL HEALTH EFFECTS OF THESE SUBSTANCES, PLEASE REFER TO OSHA'S HAZARD COMMUNICATION STANDARD (29 CFR 1910.1200) APPENDIX C.

CARCINOGENIC REFERENCES: CHROMIUM, COBALT-CHROMIUM ALLOYS, AND NICKEL HAVE BEEN IDENTIFIED BY THE INTERNATIONAL AGENCY FOR RESEARCH ON CANCER (IARC) AND / OR THE NATIONAL TOXICOLOGY PROGRAM (NTP) AS POTENTIAL CANCER CAUSING AGENTS.

EXPOSURE ROUTES:

EXPOSURE TO SPECIALTY STEEL ALLOYS OCCURS PRIMARILY FROM INHALATION OF DUST OR FUMES. HOWEVER, CONSTITUENTS OF THESE ALLOYS MAY CAUSE EFFECTS DIRECTLY UPON THE SKIN OR EYES. CERTAIN CONSTITUENTS MAY ALSO BE HARMFUL IF SWALLOWED.

FIRST AID:

INHALATION - MOVE PERSON TO FRESH AIR UNTIL RECOVERED. CONSULT A PHYSICIAN.

SKIN - WASH WITH WATER AND MILD DETERGENT. CONSULT A PHYSICIAN.

EYE - FLUSH THOROUGHLY WITH WATER. CONSULT A PHYSICIAN.

INGESTION - WHILE INGESTION OF LARGE ENOUGH QUANTITIES TO CAUSE HEALTH EFFECTS IS UNLIKELY, CONSULT A PHYSICIAN IF IT OCCURS

AGGRAVATED CONDITIONS

MEDICAL CONDITIONS, THAT ARE RECOGNIZED AS BEING POSSIBLY SUSCEPTIBLE TO AGGRAVATION BY EXPOSURE, INCLUDE — PRE-EXISTING CHRONIC SKIN, EYE, OR RESPIRATORY DISORDERS IF PROLONGED OR REPEATED OVEREXPOSURE TO FUME AND DUST OCCUR.

SECTION VI - REACTIVITY

STABILITY: STABLE

HAZARDOUS DECOMPOSITION: NONE

INCOMPATIBLE MATERIALS: NONE

POLYMERIZATION: WILL NOT OCCUR

SECTION VII - SPILL OR LEAK PROCEDURES

PRODUCT IS A SOLID METAL AS SHIPPED. NO POTENTIAL FOR SPILL OR LEAK.

SECTION VIII - SPECIAL PROTECTION INFORMATION

VENTILATION:

IF YOUR PROCESS CAUSES A RELEASE OF DUST OR FUME, USE LOCAL AND GENERAL EXHAUST VENTILATION TO KEEP AIRBORN CONCENTRATIONS OF DUST OR FUMES BELOW THE TLV.

RESPIRATORY PROTECTION:

IF YOUR PROCESS CAUSES A RELEASE OF DUST OR FUME IN EXCESS OF THE PERMISSIBLE EXPOSURE LIMIT, NIOSH APPROVED RESPIRATORS FOR PROTECTION AGAINST AIRBORN DUST OR FUMES SHOULD BE WORN. RESPIRATORS SHOULD BE USED IN ACCORDANCE WITH 29CFR 1910.134.

PROTECTIVE EQUIPMENT:

GLOVES AND BARRIER CREAMS MAY BE NECESSARY TO PREVENT SKIN SENSITIZATION AND DERMATITIS. IF YOUR PROCESS INVOLVES GRINDING OR ANY OTHER ACTION THAT CAUSES THE RELEASE OF DUST OR FUMES, APPROVED SAFETY GLASSES OR GOGGLES SHOULD BE WORN.

SECTION IX - SPECIAL PRECAUTIONS

NONE

SECTION X - ADDENDUM

SARA TITLE III REQUIREMENTS

THE PRODUCT DESCRIPTION OR TRADE NAME CONTAINS TOXIC CHEMICALS SUBJECT TO THE REPORTING REQUIREMENTS UNDER SECTION 313 OF TITLE III "THE SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT OF 1986 AND 40 CFR PART 372.

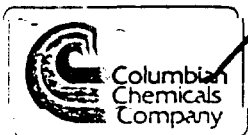
TOXIC CHEMICALS MAY INCLUDE CHROMIUM, NICKEL, MANGANESE, COBALT, COPPER, VANADIUM, TITANIUM, OR ALUMINUM (REFER TO SECTION II OF THE MSDS FOR SPECIFIC HAZARDOUS INGREDIENTS)

PROPOSITION 65 COMPLIANCE

PROPOSITION 65 "THE CALIFORNIA SAFE DRINKING WATER AND TOXIC ENFORCEMENT ACT OF 1986" PROHIBITS "ANY PERSON IN THE COURSE OF DOING BUSINESS FROM KNOWINGLY AND INTENTIONALLY EXPOSING ANY INDIVIDUAL TO A CHEMICAL KNOWN TO THE STATE OF CALIFORNIA TO CAUSE CANCER OR REPRODUCTIVE TOXICITY WITHOUT FIRST GIVING CLEAR AND REASONABLE WARNING TO SUCH INDIVIDUALS."

SPECIALTY STEEL ALLOYS, IN THE FORM IN WHICH THEY ARE SHIPPED, DO NOT POSE A THREAT TO OUR CUSTOMERS; HOWEVER, THE "GOVERNOR'S LIST OF CHEMICALS KNOWN TO CAUSE CANCER OR REPRODUCTIVE TOXICITY" DOES INCLUDE TWO CHEMICALS IDENTIFIED AS CARCINOGENS WHICH MAY BE PRESENT UNDER CERTAIN CONDITIONS. THEY ARE CHROMIUM (HEXAVALENT COMPOUNDS) AND NICKEL REFINERY DUST FROM PYROMETALLURGICAL PROCESSING.

IN ORDER FOR A CHEMICAL EXPOSURE TO OCCUR, OUR ALLOYS MUST BE SUBJECTED TO HIGH HEAT APPLICATIONS IN OXYGEN RICH ATMOSPHERES. REPRESENTATIVE OPERATIONS WOULD INCLUDE TORCH CUTTING OR WELDING.



MATE

CERRO COPPER PRODUCTS COMPANY
MSDS NUMBER - CCPC-00-0229ENVIRONMENTAL _____
SAFETY _____
REGISTRATION _____

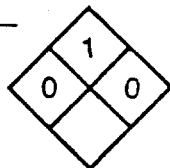
Date 8/01/85

SECTION 1 — Identification

Product Name Statex MRG
Chemical Name Oil Beaded
Carbon Black
Chemical Family Carbon
CAS No.: 1333-86-4
TSCA Inventory: Vol. 1, Page 90

Manufacturer's Name Columbian Chemicals Co.
Manufacturer's Address P.O. Box 37
Tulsa, OK 74102
Position or Department Safety & Environmental
Telephone Number (918) 744-4594

HMIS



SECTION 2 — Hazard Rating

Hazard Classification: Health 0 Flammability 1 Reactivity 0
Composition: Component Concentration Criterion and Value

Component	Concentration	Criterion and Value
<u>Carbon</u>	<u>60%</u>	<u>3.5 mg/m³ (Dust)*</u>
<u>Naphthenic Oil</u>	<u>40%</u>	

D.O.T. Hazard: Non-hazardous carbon black is listed on OSHA 29CFR 1910.1000 Table Z-1

SECTION 3 — Physical Properties

Appearance and Odor Amorphous black solid, odorless
Boiling Point (°F) NA Specific Gravity (Water = 1) 1.7-1.9 Solubility in Water negligible
Vapor Pressure (mm Hg) NA Vapor Density (Air = 1) NA Evaporation Rate (= 1) NA
Reacts if Exposed to: Light No Air No Heat No Water No Strong Oxidizer May

SECTION 4 — Fire or Explosion Data

Flash Point (°F) NA Autoignition Temp. (°F) Ignition in air above 500°F LEL (%) NA UEL (%) NA
Extinguishing Media Water spray

Special Firefighting Procedure Normal fog or nozzle jet application and/or exclusion of air.

Unusual Fire or Explosion Protection None — Carbon monoxide and carbon dioxide are emitted. It may not be obvious that carbon black is burning unless it is stirred and sparks are apparent.

SECTION 5 — Health Data

Effects of Overexposure: Acute: May cause temporary discomfort due to inhalation of dust concentration above the Permissible Exposure Limit.

Chronic: None recognized. Carbon black contains trace amounts of adsorbed polynuclear aromatic compounds (PNA), some of which have been found to be carcinogens in certain animal studies. No carcinogenic effect has been found in animals or humans due to exposure to carbon black. Carbon black is not listed in NTP Annual Report on Carcinogens. Epidemiological studies of workers in the carbon black producing industry have shown no significant health effects due to occupational exposure to carbon black.

Emergency and First Aid Procedures

Ingestion No consequences.

Inhalation Remove from exposure.

Skin Normal washing with soap and water.

Eye Rinse with water.

Irritant: Skin No

Eye No

Inhalation No

SECTION 6 — Reactivity

Stable Yes

Unstable —

Conditions to Avoid —

Incompatibility NA

Hazardous Decomposition Products Carbon monoxide and carbon dioxide when burning.

Hazardous Polymerization: No X Yes — Conditions to Avoid Excessive heat and strong oxidizers such as chlorates, bromates and nitrates.

Corrosive: No X Yes — Materials —

SECTION 7 — Spills and Leaks

Steps to be Taken in Case Material is Released or Spilled Vacuum, sweep or spray with water and collect in suitable container.

Waste Disposal Precautions Bury, or burn in accordance with local, state and federal regulations. Carbon bl. is not a hazardous waste.

SECTION 8 — Special Protection

Respirators: No — Yes X Type Dust mask above TLV

Ventilation: Use the guidelines recommended by the American Conference of Governmental Industrial Hygienists in the current edition of "Industrial Ventilation," considering the TLV.

Gloves None required

Other Normal washing with soap and water.

Eye Protection Safety glasses

SECTION 9 — Special Precautions

Handling and Storage Keep in closed containers.

DOT Hazard Label Required: No X Yes — Specify —

Other Precautions: Test for CO, and O₂ before entrance into closed storage tanks — use appropriate respirator or air line for possible exposure to carbon monoxide, carbon dioxide and inadequate oxygen content if test results indicate.

The suggestions and data provided herewith are based upon tests and information which we believe to be reliable. However, we make no guarantee with respect thereto and assume no liability resulting from the use thereof. Users should make their own investigations to determine the suitability of the information or products for their particular purpose. Furthermore, nothing contained therein is intended as permission, inducement or recommendation to violate any laws or to practice any invention covered by existing patents.

MATERIAL SAFETY DATA SHEET

NATIONAL FORGE COMPANY

PAGE (1)

Erie, Pa. Irvine, Pa.

Erie Emergency Phone 814-452-2300

SDS ID # NF50002

16512

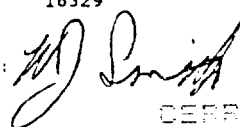
16329

Irvine Emergency Phone 814-563-7522

Original issue date: 04/16/87

Revised:

Prepared by:

CERRO COPPER PRODUCTS COMPANY
HDS NUMBER - C000-00-0000

1. IDENTIFICATION

Product Name: Low Alloy Steel Grades

(b)

Other (c)

(d)

NFPA

LABEL FLAMMABILITY: 0

HEALTH: 3

REACTIVITY: 0

H M I S PERSONAL PROTECTION: H

DOT Instructions: N/A

ENVIRONMENTAL: _____
SAFETY: _____
Hazardous: _____

2. INGREDIENTS AND HAZARDS

Ingredients	X	CAS NO.	PEL	TLV	INGREDIENT HAZARD DATA
a. CHROMIUM		7440-47-3	1 MG/M3	.05 MG/M3 313	CANCER, GASTROINTEST. LIVER; LEUKEMIA
b. NICKEL		7440-02-0	1 MG/M3	1 MG/M3 186	CANCER, LUNG & NASAL
c. MANGANESE		7439-96-5	5 MG/M3	1 MG/M3 312	EFF: KIDNEY, LIVER, RESPIRATORY, BLOOD, NS, CNS, LUNG
d. COPPER (AS DUST/MIST/FUME)		7440-50-8	1 MG/M3	.2MG/M3 349	EFF: LUNGS & GASTROINTESTINAL
e. IRON		7439-89-6	10 MG/M3	5 MG/M3 151	EFFECTS LUNGS
f. CARBON		7440-44-0	15 MG/M3	10 MG/M3 243	NUISANCE PARTICULATES, VAPORS, OR GASES
g. SILICON		4770-21-3	15 MG/M3	10 MG/M3 243	NUISANCE PARTICULATES, VAPORS, OR GASES
h.					
i.					
k.					
l.					
m.					

3. PHYSICAL DATA

Boiling (F) N/A (C) N/A Vap. Pres. (mm Hg) N/A Spec. Grav. (H2O=1) 7.7 Evap. Rate(=1) N/A
 Freezing (F) N/A (C) N/A Vap. Dens. (=1) N/A Volatile by Vol. N/A % Soluble ? N/A
 Appearance and Odor: METALLIC ODORLESS, SOLID

4. FIRE AND EXPLOSION HAZARD DATA

Flash Point (method used) N/A

Flammable Limits (LEL) N/A % (UEL) N/A % Auto-ign. Temp. 1292 DEG

Extinguishing Med. 1118 DOES NOT APPLY

Special Procedure 2062 Use that which is appropriate for the surrounding fire conditions. Use full protective clothing and self-contained breathing equipment.

Unusual Hazard 3031 N/A

Information contained in this MSDS is believed to be correct as it was obtained from sources we believe are reliable, but no representations, guarantees or warranties of any kind are made as to its accuracy. User assumes all risk and liability of any use, processing or handling of any material. Hazards connected with the use are solely the users responsibility.

5. HEALTH HAZARD DATA

Overexposure RESPIRATORY IRRITATION, MAY CAUSE PNEUMONITIS (SIDEROSIS), GIDDINESS, NAUSEA, HEADACHE, DIZZINESS, DYSPNEA
Symptoms METAL FUME FEVER.
and
Effects DELAYED SYMPTOMS 12 TO 36 HOURS - DYSPNEA RETURNS, BLUE COLOR OF SKIN, FEVER DELIRIOUS, DEATH MAY OCCUR.

CHROMIUM AND CERTAIN CHROMIUM COMPOUNDS ARE LISTED AS CARCINOGENIC BY NTP AND IARC. NICKEL IS LISTED AS A SUSPECTED CARCINOGEN BY NTP AND IARC.

Routes of entry 6108 Inhalation, Ingestion, Skin and/or Eye Contact.

EMERGENCY & 7020 INHALATION: Contact physician. Restore or support breathing, keep warm and at rest.

FIRST AID 7027 INGESTION: Give water to dilute. Induce vomiting.

PROCEDURES 7001 EYE CONTACT: immediately flush with water for 15 minutes including under the eyelids. Get medical help.

7004 SKIN CONTACT: Wash area with soap and water. Immediately remove soiled clothing.

AGGRAVATED MAY CAUSE SIGNS OF PNEUMONIA, MAY BECOME SENSITIZED, MAY CAUSE DECREASED LUNG FUNCTION AND PROGRESSIVE
MEDICAL DYSPNEA, MAY CAUSE X-RAY CHANGES OF LUNG. CHRONIC RESPIRATORY DISEASE, LIVER, KIDNEY, SKIN DISEASE,
CONDITIONS HEMATOPOIETIC DISORDERS.

6. REACTIVITY DATA

Stable ? YES * AVOID * EXTREME HEAT

Incompatibility STRONG OXIDIZERS MAY CAUSE FIRE AND EXPLOSIONS (IRON OXIDE FUME CONTACTING CALCIUM HYPOCHLORITE) STRONG
(Material to avoid) ACIDS, SULFUR, ACETYLENE GAS, MAGNESIUM.

Hazardous Decompo- TOXIC GASES, FLAMMABLE AND EXPLOSIVE HYDROGEN GAS. WELDING MAY CREATE TOXIC FUMES (CHROMIUM OXIDE).
sition Products COPPER ACETYLIDES (SHOCK SENSITIVE) HYDROGEN GAS.

May Hazardous Polymerization Occur? NO * AVOID * NONE LISTED

7. SPILL OR LEAK PROCEDURES CHEMTREC TELEPHONE # 800-424-9300 COAST GUARD TELEPHONE # 800-424-8802

Steps in case NORMAL CLEAN UP PROCEDURES. USE GOOD HOUSEKEEPING PRACTICE. WEAR APPROPRIATE RESPIRATORY PROTECTION AND
PROTECTIVE CLOTHING AS REQUIRED.

Materials NONE LISTED
released

Waste disposal 9045 Consider possible reclaim value, dispose of contaminated material in accordance with
method applicable local, state, and federal laws.

8. SPECIAL PROTECTION INFORMATION

Respiratory: If TLV/TOL EXCEEDED; USE NIOSH/MSHA APPROVED RESPIRATOR

Gloves: RECOMMENDED Eye and Face: SAFETY SHIELD/SAFETY GLASSES

Other: CONTAMINATED CLOTHING SHOULD BE REMOVED AND CLEANED OR DISCARDED.

Ventilation: LOCAL TO MAINTAIN AIR QUALITY

9. SPECIAL PRECAUTIONS

Handling and Use good housekeeping techniques to keep dust deposits in the workplace at a minimum.
storage

Other USE GOOD HYGENIC PRACTICES. DO NOT EAT, DRINK, OR SMOKE IN AREA WHERE DUST OR FUMES ARE GENERATED.
precautions

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*
*  P R O D U C T   N A M E                M S D S #
*  Low Alloy Steel Grades                NF50002
*
*
*  N F P A LABEL FLAM  0  HLTH  3  REACT  0
*      (Ingredients & Hazards)
*      a. CHROMIUM
*  CANCER,GASTROINTEST.  LIVER; LEUKEMIA
*      -----
*      b. NICKEL
*  CANCER, LUNG & NASAL
*      -----
*      c. MANGANESE
*  EFF KIDNEY,LIVER,RESPIRATORY,BLOOD,NS,CNS,LUNG
*      -----
*      d. COPPER (AS DUST/MIST/FUME)
*  EFF; LUNGS & GASTROINTESTINAL
*      -----
*      e. IRON
*  EFFECTS LUNGS
*      -----
*
*      N A T I O N A L   F O R G E
*      Erie, Pa.         Irvine, Pa.
*      16512             16329
*      814-452-2300      814-563-7522
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*
*  R O D U C T   N A M E                M S D S #
*  Low Alloy Steel Grades                NF50002
*
*
*  N F P A LABEL FLAM  0  HLTH  3  REACT  0
*      (Ingredients & Hazards)
*      a. CHROMIUM
*  CANCER,GASTROINTEST.  LIVER; LEUKEMIA
*      -----
*      b. NICKEL
*  CANCER, LUNG & NASAL
*      -----
*      c. MANGANESE
*  EFF:KIDNEY,LIVER,RESPIRATORY,BLOOD,NS,CNS,LUNG
*      -----
*      d. COPPER (AS DUST/MIST/FUME)
*  EFF; LUNGS & GASTROINTESTINAL
*      -----
*      e. IRON
*  EFFECTS LUNGS
*      -----
*
*      N A T I O N A L   F O R G E
*      Erie, Pa.         Irvine, Pa.
*      16512             16329
*      814-452-2300      814-563-7522
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STAINLESS STEEL, STAINLESS

MATERIAL SAFETY DATA SHEET

NATIONAL FORGE COMPANY

PAGE (1)

Erie, Pa. Irvine, Pa.

Erie Emergency Phone 814-452-2300

DS ID # NF50004

16512

16329

Irvine Emergency Phone 814-563-7522

Original issue date: 04/16/87

Revised:

Prepared by:

1. IDENTIFICATION

Product Name: Stainless Steel

(b)

Other (c)

(d)

NFPA

LABEL FLAMMABILITY: 1

HEALTH: 3

REACTIVITY: 0

H M I S PERSONAL PROTECTION: J

DOT Instructions: N/A

DEPT. OF LABOR, OCCUPATIONAL SAFETY AND HEALTH
MSDS NUMBER - OSHA-00-0201
SUPPLEMENTAL INFORMATION
PURCHASING: (PRIOR)

2. INGREDIENTS AND HAZARDS

Ingredients	%	CAS NO.	PEL	TLV	INGREDIENT HAZARD DATA
a. CHROMIUM	>21.	7440-47-3	.1 MG/M3	.05 MG/M3 313	CANCER, GASTROINTEST. LIVER, LEUKEMIA
b. NICKEL	>15.	7440-02-0	1 MG/M3	1 MG/M3 186	CANCER, LUNG & NASAL
c. COBALT (AS DUST)	>.3.	7440-48-4	.1 MG/M3	.05 MG/M3 271	Acute Toxicity, High Risk; Cumulative Lung Damag
d. MOLYBDENUM (AS DUST)	>4 .	7439-98-7	15 MG/M3	10 MG/M3 339	RESP. IRR; LIVER/KIDNEY DAMAGE BONE DEFORMITY
e. MANGANESE	2 .	7439-96-5	5 MG/M3	1 MG/M3 312	EFF: KIDNEY, LIVER, RESPIRATORY, BLOOD, NS, CNS, LUNG
f. TITANIUM (AS DUST)	>.6.	7440-32-6	15 MG/M3	10 MG/M3 234	IRRITANT; EYE & RESPIRATORY SYSTEM
g. TANTALUM (AS DUST)	1 .	7440-25-7	5 MG/M3	5 MG/M3 157	TOXIC AND IRRITATING FUME
h. IRON		7439-89-6	10 MG/M3	5 MG/M3 151	EFFECTS LUNGS
i. SILICON	1 .	7440-21-3	15 MG/M3	10 MG/M3 243	NUISANCE PARTICULATES, VAPORS, OR GASES

k.

l.

m.

3. PHYSICAL DATA

Boiling (F) N/A (C) N/A Vap. Pres. (mm Hg) N/A Spec. Grav. (H2O=1) 7.6-7.8 Evap. Rate(=1) N/A
Freezing (F) N/A (C) N/A Vap. Dens. (=1) N/A Volatile by Vol. NA/ % Soluble ? INSOLUBLE
Appearance and Odor: METALLIC, ODORLESS

4. FIRE AND EXPLOSION HAZARD DATA

Flash Point (method used) N/A Flammable Limits (LEL) N/A % (UEL) N/A % Auto-ign. Temp. N/A
Extinguishing Med. DRY SAND, DOLOMITE, GRAPHITE POWDER

Special Procedure 2062 Use that which is appropriate for the surrounding fire conditions. Use full protective clothing and self-contained breathing equipment.

Unusual Hazard 3030 HIGH CONCENTRATIONS OF DUST MAY EXPLODE

Information contained in this MSDS is believed to be correct as it was obtained from sources we believe are reliable, but no representations, guarantees or warranties of any kind are made as to its accuracy. User assumes all risk and liability of any use, processing or handling of any material. Hazards connected with the use are solely the users responsibility.

HEALTH HAZARD DATA

Overexposure IRRITATION EYES, UPPER RESPIRATORY MAY CAUSE PNEUMONITIS, GIDDINESS, NAUSEA, METAL FUME FEVER, HEADACHE,
Symptoms DIZZINESS, DYSPNEA, COUGH, SKIN SENSITIZER, DEFATTING AGENT, DERMATITIS.
and
Effects DELAYED SYMPTOMS 12 TO 36 HOURS - DYSPNEA RETURNS, BLUE COLOR OF SKIN, FEVER, DELIRIOUS, DEATH MAY OCCUR.

CHROMIUM IS LISTED AS A CARCINOGEN BY NTP AND IARC. NICKEL IS LISTED AS A SUSPECTED CARCINOGEN BY NTP AND IARC.

Routes of entry 6108 Inhalation, Ingestion, Skin and/or Eye Contact.

EMERGENCY & 7020 INHALATION: Contact physician. Restore or support breathing, keep warm and at rest.

FIRST AID 7038 INGESTION: Give water to dilute, Induce vomiting. Get medical help.

PROCEDURES 7001 EYE CONTACT: Immediately flush with water for 15 minutes including under the eyelids. Get medical help.

7004 SKIN CONTACT: Wash area with soap and water. Immediately remove soiled clothing.

AGGRAVATED KIDNEY DISEASE, CHRONIC RESPIRATORY DISEASE, LIVER DISEASE, EMPHYSEMA.

MEDICAL
CONDITIONS

6. REACTIVITY DATA

Stable ? YES * AVOID * EXTREME HEAT

Incompatibility STRONG ACIDS, SULFUR. STRONG OXIDIZERS CONTACTING DUST IS EXPLOSIVE.

(Material to avoid)

Hazardous Decompo- MOLYBDENUM OXIDE, SULFUR DIOXIDE, HYDROGEN GAS, TOXIC, EXPLOSIVE AND FLAMMABLE GASES.
sition Products

May Hazardous Polymerization Occur? NO * AVOID * NONE LISTED

7. SPILL OR LEAK PROCEDURES CHEMTREC TELEPHONE # 800-424-9300 COAST GUARD TELEPHONE # 800-424-8802

Steps in case NORMAL CLEAN UP PROCEDURES. USE GOOD HOUSEKEEPING PRACTICE. WEAR APPROPRIATE RESPIRATORY PROTECTION AND
PROTECTIVE CLOTHING AS REQUIRED. VENTILATE AREA.

Materials NONE LISTED

released

Waste disposal 9045 Consider possible reclaim value, dispose of contaminated material in accordance with
method applicable local, state, and federal laws.

8. SPECIAL PROTECTION INFORMATION

Respiratory: IF TLV/PEL EXCEEDED: USE NIOSH/MSHA APPROVED RESPIRATOR

Gloves: RECOMMENDED

Eye and Face: SAFETY SHIELD/SAFETY GLASSES

Other: CONTAMINATED CLOTHING SHOULD BE REMOVED AND CLEANED OR DISCARDED.

Ventilation: LOCAL TO MAINTAIN AIR QUALITY

9. SPECIAL PRECAUTIONS

Handling and Use good housekeeping techniques to keep dust deposits in the workplace at a minimum.
storage

Other USE GOOD HYGENIC PRACTICES. DO NOT EAT, DRINK, OR SMOKE IN AREA WHERE DUST OR FUMES ARE GENERATED.
precautions

```

*****
*
* PRODUCT NAME                      MSDS #
* Stainless Steel                   NF50004
*
* NFPA LABEL FLAM 1  HLTH 3  REACT 0
* (Ingredients & Hazards)
* a. CHROMIUM
* CANCER,GASTROINTEST. LIVER; LEUKEMIA
* -----
* b. NICKEL
* CANCER, LUNG & NASAL
* -----
* c. COBALT (AS DUST)
* Acute Toxicity,High Risk; Cumulative Lung Damage
* -----
* d. MOLYBDENUM (AS DUST)
* RESP. IRR; LIVER/KIDNEY DAMAGE BONE DEFORMITY
* -----
* e. MANGANESE
* EFF:KIDNEY,LIVER,RESPIRATORY,BLOOD,NS,CNS,LUNG
* -----
* NATIONAL FORGE
* Erie, Pa.      Irvine, Pa.
* 16512          16329
* 814-452-2300   814-563-7522
*
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STEEL, 100L

MATERIAL SAFETY DATA SHEET

NATIONAL FORGE COMPANY

PAGE (1)

Erie, Pa. Irvine, Pa.

Erie Emergency Phone 814-452-2300

MSDS ID # NF50006

16512

16329

Irvine Emergency Phone 814-563-7522

Original issue date: 04/16/87

Revised:

Prepared by:

[Signature]

CERES COPPER PRODUCTS COMPANY
MSDS NUMBER - CCPC-00-0232

1. IDENTIFICATION

Product Name: Tool Steel

(b)

Other (c)

(d)

NFPA

LABEL FLAMMABILITY: 1

HEALTH: 2

REACTIVITY: 0

H M I S PERSONAL PROTECTION: H

DOT Instructions: N/A

APPROVALS:
ENVIRONMENTAL: _____
SAFETY: _____
REGULATORY: _____

2. INGREDIENTS AND HAZARDS

Ingredients	%	CAS NO.	PEL	TLV	INGREDIENT HAZARD DATA
a. CHROMIUM (FUME)		7440-47-3	.1 MG/M3	.1 MG/M3 313	CANCER, GASTROINTEST. LIVER; LEUKEMIA
b. NICKEL		7440-02-0	1 MG/M3	1 MG/M3 186	CANCER, LUNG & NASAL
c. MOLYBDENUM (AS DUST)		7439-98-7	15 MG/M3	10 MG/M3 339	RESP. IRR; LIVER/KIDNEY DAMAGE BONE DEFORMITY
d. MANGANESE		7439-96-5	5 MG/M3	1 MG/M3 312	EFF: KIDNEY, LIVER, RESPIRATORY, BLOOD, NS, CNS, LUNG
e. COPPER (DUST & FUME)		7440-50-8	.1 MG/M3	.2 MG/M3 349	EFF: LUNGS & GASTROINTESTINAL
f. VANADIUM		7440-62-2	.5 MG/M3	.05 MG/M3 322	EFFECTS: EYE, NOSE, RESPIRATORY
g. ALUMINUM		7429-90-5	N/A	10 MG/M3 117	EXTREMELY FLAMMABLE
h. TUNGSTEN		7440-33-7	15 MG/M3	10 MG/M3 240	EFFECTS: LUNG & SKIN
i. IRON		7439-89-6	10 MG/M3	5 MG/M3 151	EFFECTS LUNGS
j. CARBON (DUST)		7440-44-0	15 MG/M3	10 MG/M3 243	NUISANCE PARTICULATES, VAPORS, OR GASES
k. SILICON (DUST)		7440-21-3	15 MG/M3	10 MG/M3 243	NUISANCE PARTICULATES, VAPORS, OR GASES
l.					
m.					

3. PHYSICAL DATA

Boiling (F) N/A (C) N/A Vap. Pres. (mm Hg) N/A Spec. Grav. (H2O=1) 7.6-7.7 Evap. Rate(=1) N/A
Freezing (F) N/A (C) N/A Vap. Dens. (=1) N/A Volatile by Vol. N/A % Soluble ? INSOLUBLE
Appearance and Odor: METALLIC, ODORLESS

4. FIRE AND EXPLOSION HAZARD DATA

Flash Point (method used) N/A Flammable Limits (LEL) N/A % (UEL) N/A % Auto-ign. Temp. N/A
Extinguishing Med. DRY SAND, DOLOMITE, GRAPHITE POWDER

Special Procedure 2062 Use that which is appropriate for the surrounding fire conditions. Use full protective clothing and self-contained breathing equipment.

Unusual Hazard 3030 HIGH CONCENTRATIONS OF DUST MAY EXPLODE.

Information contained in this MSDS is believed to be correct as it was obtained from sources we believe are reliable, but no representations, guarantees or warranties of any kind are made as to its accuracy. User assumes all risk and liability of any use, processing or handling of any material. Hazards connected with the use are solely the users responsibility.

HEALTH HAZARD DATA

Overexposure METAL FUME FEVER, HEADACHE, DIZZINESS, NAUSEA, GODDINESS, DYSPNEA, COUGH, SKIN SENSITIZER, DEFATTING

Symptoms AGENT, DERMATITIS, IRRITATION UPPER, RESPIRATOR, EYES. MAY CAUSE PNEUMONITIS BRONCHITIS, WHEEZING CHEST PAIN,
and CONJUNCTIVITIS, NASOPHARYNGITIS.

Effects

DELAYED SYMPTOMS 12 TO 36 HOURS - DYSPNEA RETURNS, BLUE COLOR OF SKIN, FEVER, DELIRIUS, DEATH MAY OCCUR.

CHROMIUM IS LISTED AS A CARCINOGEN BY NTP AND IARC. NICKEL IS LISTED AS A SUSPECTED CARCINOGEN BY NTP AND IARC.

Routes of entry 6108 Inhalation, Ingestion, Skin and/or Eye Contact.

EMERGENCY & 7020 INHALATION: Contact physician. Restore or support breathing, keep warm and at rest.

FIRST AID 7038 INGESTION: Give water to dilute, Induce vomiting. Get medical help.

PROCEDURES 7001 EYE CONTACT: immediately flush with water for 15 minutes including under the eyelids. Get medical help.

7004 SKIN CONTACT: Wash area with soap and water. Immediately remove soiled clothing.

7003 SKIN CONTACT: Wash area with soap and water. Get medical attention if irritation continues.

AGGRAVATED KIDNEY DISEASE, CHRONIC RESPIRATORY DISEASE, LIVER DISEASE, EMPHYSEMA, BRONCHITIS, WHEEZING CHEST PAIN,

MEDICAL ALLERGIC SKIN REACTION.

CONDITIONS

SHOULD DO PERIODIC MEDICAL EXAM.

6. REACTIVITY DATA

Stable ? YES * AVOID * EXTREME HEAT

Incompatibility STRONG ACIDS, SULFUR. STRONG OXIDIZERS CONTACTING DUST IS EXPLOSIVE.

(Material to avoid)

Hazardous Decompo- MOLYBDENUM OXIDE, SULFUR DIOXIDE, HYDROGEN GAS, TOXIC, EXPLOSIVE AND FLAMMABLE GASES.
sition Products

May Hazardous Polymerization Occur? NO * AVOID * NONE LISTED

7. SPILL OR LEAK PROCEDURES CHEMTREC TELEPHONE # 800-424-9300 COAST GUARD TELEPHONE # 800-424-8802

Steps in case NORMAL CLEAN UP PROCEDURES. USE GOOD HOUSEKEEPING PRACTICE. WEAR APPROPRIATE RESPIRATORY PROTECTION AND
PROTECTIVE CLOTHING AS REQUIRED. VENTILATE AREA.

Materials NONE LISTED

released

Waste disposal 9045 Consider possible reclaim value, dispose of contaminated material in accordance with
method applicable local, state, and federal laws.

8. SPECIAL PROTECTION INFORMATION

Respiratory: IF TLV/PEL EXCEEDED: USE NIOSH/MSHA APPROVED RESPIRATOR

Gloves: RECOMMENDED

Eye and Face: SAFETY SHIELD/SAFETY GLASSES

Other: CONTAMINATED CLOTHING SHOULD BE REMOVED AND CLEANED OR DISCARDED.

Ventilation: LOCAL TO MAINTAIN AIR QUALITY

9. SPECIAL PRECAUTIONS

Handling and Use good housekeeping techniques to keep dust deposits in the workplace at a minimum.
storage

Other USE GOOD HYGENIC PRACTICES. DO NOT EAT, DRINK, OR SMOKE IN AREA WHERE DUST OR FUMES ARE GENERATED.
precautions

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* Tool Steel                        NF50006
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* a. CHROMIUM (FUME)
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* b. NICKEL
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* EFF: LUNGS & GASTROINTESTINAL
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MATERIAL SAFETY DATA SHEET

ISSUE DATE: 5/22/86

I. IDENTIFICATION

MANUFACTURER'S NAME: Various
COMMON NAME: Alloy Steel Bars, Plates & Pipes
PRODUCT/TRADE NAME: Accurloy, Nichroloy, Tungwin, Hi-Case, Baldwin #1/#711/AH, Mangabraz, Tuffbraz, Hi-Mang.



Baldwin Steel

7255 Division St. 4111 Twelfth St.
 Bedford, OH 44146 Ecorse, MI 48229
 Tel: (216) 248-9500 Tel: (313) 928-7171

II. INGREDIENTS AND RECOMMENDED OCCUPATIONAL EXPOSURE LIMITS

NOTE: PRODUCTS UNDER NORMAL CONDITIONS DO NOT REPRESENT AN INHALATION, INGESTION OR CONTACT HEALTH HAZARD

COMPONENTS (*) (1)	C A S NUMBER	Z WEIGHT (2)	EXPOSURE LIMITS	
			OSHA PEL (mg/m ³)	ACGIH TLV (mg/m ³)
Base Metal: Iron (Fe)	7439-89-6	>96%	10. as iron oxide	5. as iron oxide
Alloying Elements:				
Aluminum (Al)	7429-90-5	< 1%	None established	10. as dust, 5. as fume
Boron (B)	7440-42-8	< .005%	15. Boron oxide	10. Boron oxide
Carbon (C)	7440-44-0	< 1%	None established	None established
(3) Chromium (Cr)	7440-47-3	< 1%	1.0 as Cr. metal	0.5 as Cr. metal
Copper (Cu)	7440-50-8	< 1%	0.1 as fume; 1.0 as dust	0.2 as fumes; 1.0 as dust
Manganese (Mn)	7439-96-5	< 3%	5. as dust & fume	1. as fume; 5. as dust
Molybdenum (Mo)	7439-98-7	< 1%	5. as soluble compds.	5. as soluble compds.
(3) Nickel (Ni)	7440-02-0	< 2%	15. as insoluble compds.	10. as insoluble compds.
Phosphorous (P)	7723-14-0	< 1%	1. as soluble compd.	1. as soluble compd.
Silicon (Si)	7440-21-3	< 1%	0.1 as phosphorous	0.1 as phosphorous
Sulphur (S)	7704-34-9	< 1%	None established	5. respirable dust
Tungsten (W)	7440-33-7	< 1%	13. as sulphur dioxide	5. as sulphur dioxide
			None established	5. as insoluble compds.
Vanadium (V)	7440-62-2	< 1%	0.5 as dust; 0.1 as fume	0.5 as dust & fume

CERRO COPPER PRODUCTS COMPANY
 MSDS NUMBER - CCPC-00-0233

APPROVALS:

ENVIRONMENTAL: _____ (PRIOR)

SAFETY: _____ (PRIOR)

PURCHASING: _____ (PRIOR)

- (1) ALL STEEL PRODUCTS CONTAIN SMALL QUANTITIES OF VARIOUS ELEMENTS (FREQUENTLY REFERRED TO AS 'TRACE' OR 'RESIDUAL' ELEMENTS, LESS THAN .2%) WHICH GENERALLY ORIGINATE IN THE RAW MATERIAL USED.
- (2) Z OF ALLOYING MATERIAL VARIES WITH THE TYPE OF PRODUCT.
- (3) CHROMIUM & NICKEL AND THEIR COMPOUNDS ARE LISTED IN THE 3RD ANNUAL REPORT ON CARCINOGENS, AS PREPARED BY THE NATIONAL TOXICOLOGY PROGRAM.
- (*) IN ADDITION, AN OIL COATING IS OFTEN ADDED TO OUR PRODUCTS AS A RUST INHIBITOR.

III. PHYSICAL DATA

MATERIAL IS (AT NORMAL CONDITIONS)	APPEARANCE AND ODOR
SOLID	GRAY/BLACK - NO ODOR
MELTING POINT (BASE METAL)	SPECIFIC GRAVITY
2650° - 2750°F	Approximately 7

IV. FIRE AND EXPLOSION HAZARD DATA

Steel products in the solid state present no fire or explosion hazard

V. REACTIVITY DATA

STABILITY	INCOMPATIBILITY (MATERIALS TO AVOID)
Chemically Stable	Reacts with strong acids to produce Hydrogen Gas.

CONDITIONS TO AVOID
 Non-ventilated areas during welding, burning, grinding, machining. Metallic fumes or dust may be produced.

HAZARDOUS DECOMPOSITION PRODUCTS

May liberate metal fumes, metal oxides, or other oxides if exposed to temperatures above the melting point.

VI. HEALTH HAZARD DATA

NOTE: STEEL PRODUCTS IN THE NATURAL STATE DO NOT PRESENT AN INHALATION, INGESTION OR CONTACT HAZARD. HOWEVER, OPERATIONS SUCH AS BURNING, WELDING, SAWING, BRAZING AND GRINDING MAY RELEASE FUMES AND/OR DUSTS WHICH MAY PRESENT HEALTH HAZARDS IF TLVS ARE EXCEEDED.

EFFECTS OF OVEREXPOSURE: MAJOR EXPOSURE HAZARD: INHALATION

ACUTE: The inhalation of high concentrations of freshly formed oxide fumes and dusts of metals in the respirable particle size range can cause an influenza-like illness termed 'Metal Fume Fever'. Typical symptoms last 12 to 48 hours and are characterized by metallic taste in the mouth, dryness and irritation of the throat, followed by weakness, muscle pain, fever and chills.

CHRONIC inhalation of high concentrations of iron oxide fumes and dusts may lead to a benign pneumoconiosis (siderosis). Inhalation of high concentrations of ferric oxide may possibly enhance the risk of lung cancer development in workers exposed to pulmonary carcinogens.

Exposure to high concentrations of nickel dusts and fumes can cause sensitization dermatitis, respiratory irritation, asthma, pulmonary fibrosis and edema. Certain forms of nickel dust may cause nasal or lung cancer in humans.

Repeated or prolonged exposure to hexavalent chromium compounds may cause respiratory irritation, nosebleed, ulceration and perforation of the nasal septum. Industrial exposure to certain forms of hexavalent chromium has been related to an increased incidence of lung cancer.

EMERGENCY AND FIRST AID PROCEDURES

INHALATION: Remove overexposed person to fresh air, if condition continues seek medical attention immediately.

EYE CONTACT: Flush eye with water to remove the particle AND get medical attention to ensure the particle has been completely removed.

VII. SPILL OR LEAK PROCEDURES

NOT APPLICABLE TO STEEL IN THE SOLID STATE.

VIII. SPECIAL PROTECTION INFORMATION

RESPIRATORY: NIOSH/MSHA-approved dust and fume respirators should be used to avoid excessive inhalation of particulates. Appropriate respirator selection depends on the magnitude of exposure.

SKIN: Protective gloves should be worn as required for welding, burning or handling operations.

EYE: Use safety glasses or goggles as required for welding, burning, sawing, brazing, grinding or machining operations.

VENTILATION: Local exhaust ventilation should be provided when welding, burning, sawing, brazing, grinding or machining to prevent excessive dust or fume exposure.

OTHER PROTECTIVE EQUIPMENT:

Depending upon the conditions of use and specific work situations, additional protective equipment and/or clothing may be required to control exposures.

IX. SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE:

Operations with the potential for generating high concentrations of airborne particulates should be evaluated and controlled as necessary. Avoid breathing metal fumes and/or dusts.

The information in this MSDS was obtained from sources which we believe are reliable. However Baldwin Steel its corporate officers, employees and representatives make no warranty, expressed or implied, as to the absolute correctness, accuracy or sufficiency of any of the foregoing or that additional or other measures may not be required under particular conditions.

The conditions or methods of handling, storage, use and disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of the product.

SECTION I - GENERAL INFORMATION

CHEMICAL NAME & SYNONYMS N/A TRADE NAME & SYNONYMS STUD PULL ELECTRODE (2)
CHEMICAL FAMILY N/A FORMULA X<--MIXTURE
MANUFACTURER'S NAME: DURATRODE, A PARTSMASTER CO., DIV OF NCH (1)
ADDRESS (NUMBER, STREET, CITY, STATE & ZIP CODE) P.O. BOX 152170 IRVING, TX 75015
PREPARED BY: J. MICHAEL COLE PRODUCT CODE NUMBER 20103000 EMERGENCY TELEPHONE NUMBER 214-438-1381

SECTION II- HAZARDOUS INGREDIENTS

THE HAZARDS PRESENTED BELOW ARE THOSE OF THE INDIVIDUAL COMPONENTS AS THE PRODUCT MIXTURE HAS NOT BEEN TESTED AS A WHOLE.

CHEMICAL NAME (INGREDIENTS)	HAZARD	TLV*	PEL*	CAS#
CHROMIUM	IRRITANT	5 MG/M3	1 MG/M3	7440-47-3
MANGANESE	IRRITANT	C5 MG/M3	C5 MG/M3	7439-96-5
MOLYBDENUM	IRRITANT	10MG/M3	15 MG/M3	7439-98-7
IRON	IRRITANT	NONE	NONE	7439-89-6
NICKEL	IRRITANT	1MG/M3	1 MG/M3	7440-02-0
CALCIUM CARBONATE(SOURCE-3*)SECT	IRRITANT	10 MG/M3	NONE	1317-65-3
ION VI FOR MORE INFO.-TOXICITY				

STUD PULL ELECTRODE

SECTION III - PHYSICAL DATA

PAGE : 02

BOILING PT. (FAHRENHEIT)	N/A	SPEC GRAVITY (H2O=1)	N/A
VAPOR PRESSURE (MM HG)	N/A	COLOR	N/A
VAPOR DENSITY (AIR=1)	N/A	ODOR	N/A
PH @ 100%	N/A	CLARITY	N/A
PERCENT VOLATILE BY VOLUME (%)	N/A	EVAPORATION RATE (BU AC = 1)	N/A
SOLUBILITY IN WATER	N/A		
VISCOSITY	N/A		

SECTION IV - FIRE AND EXPLOSION HAZARD

FLASH POINT (METHOD USED)	N/A	FLAMMABLE LIMITS	N/A	LEL	N/A	UEL	N/A
EXTINGUISHING MEDIA "ALCOHOL" <--FOAM	<--FOAM	<--CO2	<--CHEMICAL	WATER	<--SPRAY	<--OTHER	
SPECIAL FIRE FIGHTING PROCEDURES SEE AMERICAN NATIONAL STANDARD Z49.1, SAFETY IN WELDING AND CUTTING, PUBLISHED BY THE AMERICAN WELDING SOCIETY AND OSHA PUBLICATION 2206(29 C.F.R. 192 1910)							

UNUSUAL FIRE & EXPLOSION HAZARDS
NON-FLAMMABLE WELDING ARC AND SPARK CAN IGNITE COMBUSTIBLES.

NFPA HAZARD RATING (0=INSIGNIFICANT;1=SLIGHT;2=MODERATE;3=HIGH;4=EXTREME):
2 <--HEALTH 0 <--FLAMMABILITY 0 <--REACTIVITY W<--SPECIAL

SECTION V - HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE :
NOT ESTABLISHED FOR MIXTURE SEE SECTION II

EFFECTS OF OVEREXPOSURE :
- ACUTE - (SHORT TERM EXPOSURE)
FUMES AND GASES CAN BE DANGEROUS TO YOUR HEALTH. SHORT TERM OVEREXPOSURE

CERRO COPPER PRODUCTS COMPANY
MSDS NUMBER 0010-00-0203
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ENVIRONMENTAL HEALTH & SAFETY
PURCHASING DEPARTMENT

TO WELDING FUMES MAY RESULT IN DISCOMFORT SUCH AS: DIZZINESS, NAUSEA, OR DRYNESS OR IRRITATION OF NOSE, THROAT, OR EYES.

LONG TERM OVEREXPOSURE MAY LEAD TO SIDEROSIS (IRON DEPOSITS IN THE LUNG) AND IS BELIEVED BY SOME INVESTIGATORS TO AFFECT PULMONARY FUNCTION. ARC RAYS CAN INJURE EYES AND BURN SKIN. ELECTRIC SHOCK CAN KILL.

PRIMARY ROUTE OF ENTRY: <-- INHALATION <-- INGESTION <-- ABSORPTION

EMERGENCY & FIRST AID PROCEDURES

INHALATION:
REMOVE FROM EXPOSURE AREA AND CALL FOR MEDICAL AID. ADMINISTER OXYGEN IF BREATHING IS DIFFICULT. IF NOT BREATHING BEGIN ARTIFICIAL RESPIRATION. IF NO DETECTABLE PULSE BEGIN EXTERNAL HEART MASSAGE. EMPLOY FIRST AID TECHNIQUES RECOMMENDED BY THE AMERICAN RED CROSS. IN CASE OF ELECTRICAL SHOCK, TURN OFF POWER PRIOR TO REMOVAL FROM EXPOSURE AREA AND ADMINISTER FIRST AID.

EYE CONTACT:
FLUSH WITH WATER FOR AT LEAST 15 MINUTES.

SKIN CONTACT:
REMOVE CONTAMINATED CLOTHING. WASH SKIN WITH SOAP AND WATER.

INGESTION:
DO NOT INDUCE VOMITING. OBTAIN MEDICAL ATTENTION.

NOTES TO PHYSICIAN :

N/A

SECTION VI - TOXICITY INFORMATION

PRODUCT CONTAINS CHEMICAL LISTED AS CARCINOGEN OR POTENTIAL CARCINOGEN BY:

IARC	<--YES X<--NO	NTP	<--YES X<--NO	OSHA	<--YES X<--NO	ACGIH	<--YES X<--NO	OTHER	<--YES X<--NO
------	------------------	-----	------------------	------	------------------	-------	------------------	-------	------------------

HAZARDOUS MIXTURES CONT.:

	CAS#	EXPOSURE LIMIT MG/M3	SOURCE
TITANIUM DIOXIDE	13463-67-7	15/10	(1)*/(2)
SILICON DIOXIDE	60676-86-0	0.1/0.1	(1)*/(2)
SODIUM ALUMINUM FLUORIDE	15096-52-3	2.5/2.5	(1)*/(2)
(1)* OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION, 29 C.F.R. 1910.1000 PER MISSIBLE EXPOSURE LIMIT (PEL)			
(2)* AMERICAN CONFERENCE OF GOVERNMENTAL INDUSTRIAL HYGIENISTS (ACGIH) THRESHOLD LIMIT (TLV(R))			
(3)* NOT KNOWN: NUISANCE PARTICULATE CONCENTRATION PER ACGIH IS 10MG/M3			

SECTION VII - REACTIVITY DATA

STABILITY	X<--STABLE	<--UNSTABLE	CONDITIONS TO AVOID
-----------	------------	-------------	---------------------

REFER TO REFERENCES FOR FURTHER INFORMATION (SECTION XII)

STUD PULL ELECTRODE

(CONTINUED)

SECTION VII - REACTIVITY DATA

PAGE : 04

INCOMPATIBILITY (MATERIALS TO AVOID)

N/A

HAZARDOUS DECOMPOSITION PRODUCTS

REFER TO REFERENCES FOR FURTHER INFORMATION (SECTION XII)

HAZARDOUS	WILL NOT X<--OCCUR	MAY <--OCCUR	CONDITIONS TO AVOID
-----------	-----------------------	-----------------	---------------------

POLYMERIZATION

SECTION VIII - SPILL OR LEAK PROCEDURES

STEPS TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

N/A

WASTE DISPOSAL METHOD

PREVENT WASTE FROM CONTAMINATING SURROUNDING ENVIRONMENT. DISCARD ANY PROUDCT, RESIDUE, DISPOSABLE CONTAINER, OR LINER IN AN ENVIRONMENTALLY ACCEPTABLE MANNER, IN FULL COMPLIANCE WITH FEDERAL, STATE AND LOCAL REGULATIONS.

NEUTRALIZING AGENT

N/A

SECTION IX - SPECIAL PROTECTION INFORMATION

REQUIRED VENTILATION

USE ENOUGH VENTILATION, LOCAL EXHAUST AT THE ARC, OR BOTH, TO KEEP THE FUME S AND GASES BELOW THE TLV'S IN THE WORKERS BREATHING ZONE AND THE GENERAL AREA. TRAIN THE WELDOR TO KEEP HIS HEAD OUT OF THE FUMES.

RESPIRATORY PROTECTION

WELD FUME RESPIRATOR OR AIRLINE RESPIRATOR FOR CONFINED SPACE OR WHERE EXPOSURES ARE ABOVE TLV.

PROTECTIVE GLOVES

WELDOR GLOVES

EYE PROTECTION

SHADED LENS

OTHER PROTECTION

WELDOR'S PROTECTIVE CLOTHING.

STORAGE TEMPERATURE
 000000<--MAX 000000<--MIN INDOOR HEATED REFRIGERATED OUTDOOR

PRECAUTIONS TO BE TAKEN IN HANDLING & STORING
 ARC AND SPARKS COULD BE THE SOURCE OF IGNITION OF
 COMBUSTIBLE PRODUCTS.

OTHER PRECAUTIONS
 N/A

SECTION XI - TRANSPORTATION * (FOR FUTURE USE)

APPLICABLE REGULATIONS
 <--49 CFR <--IMCO <--TARIFF 6 D <--IATA <--MILITARY AIR (4FR 71-4)

SHIPPING NAME

HAZARD CLASS ID NUMBER REPORT QTY

LABELS LIMITED QTY

UNIT CONTAINER

DOT SP5 CONTAINER NET EXPLOSIVE WT.

AEROSOL PROPELLANT(S)

SECTION XII - REFERENCES

MANUFACTURER'S MATERIAL SAFETY DATA SHEET.

ADDITIONAL INFORMATION SECTION VII REACTIVITY DATA:
 WHEN THE ELECTRODE IS CONSUMED, THE FUME AND GAS DECOMPOSITION PRODUCTS ARE
 DIFFERENT IN PERCENT AND FORM FROM THE INGREDIENTS LISTED IN SECTION II.
 THESE COMPONENTS ARE ALWAYS PRESENT AS COMPLEX COMPOUNDS AND NOT AS METALS.
 (CHARACTERIZATION OF ARC WELDING FUME: AMERICAN WELDING SOCIETY). REASONAB-
 LY EXPECTED FUME CONSTITUENTS FROM THESE PRODUCTS WOULD INCLUDE FLUORIDES, A
 ND COMPLEX OXIDES OF IRON, CHROMIUM, NICKEL, MANGANESE, AND SILICON. COMPLE
 X OXIDES CONTAINING MOLYBDENUM AND COPPER WILL BE FOUND IN THE FUMES OF TH
 ESE PRODUCTS CONTAINING THESE ELEMENTS. THE FUME LIMIT FOR CR VI (0.05MG/M3)
 WILL BE REACHED BEFORE THE GENERAL LIMIT OF 5MG/M3 FOR FUMES IS REACHED. MO

STUD PULL ELECTRODE

(CONTINUED)

SECTION XII - REFERENCES

PAGE : 06

NITOR FUMES FOR CR VI LEVEL. GASEOUS REACTION PRODUCTS MAY INCLUDE CARBON M
 ONOXIDE AND CARBON DIOXIDE. OZONE AND NITROGEN OXIDES MAY BE FORMED BY THE
 RADIATION FROM THE ARC.
 W* DO NOT USE WATER TO EXTINGUISH MOLTEN METAL BECAUSE HAZARDOUS METAL
 FUMES MAY BE FORMED. USE WATER TO KEEP METAL COOL IN A FIRE SITUATION.

THE INFORMATION CONTAINED HEREIN IS BASED ON DATA CONSIDERED
 ACCURATE IN LIGHT OF CURRENT FORMULATION. HOWEVER, NO WARRANTY
 IS EXPRESSED OR IMPLIED REGARDING THE ACCURACY OF THIS DATA
 OR THE RESULTS TO BE OBTAINED FROM THE USE THEREOF.

DURATRODE, A PARTSMaster CO., DIV OF NCH ASSUMES NO RESPONSIBILITY
 FOR PERSONAL INJURY OR PROPERTY DAMAGE CAUSED BY THE USE, STORAGE
 OR DISPOSAL OF THE PRODUCT IN A MANNER NOT RECOMMENDED ON THE
 PRODUCT LABEL. USERS ASSUME ALL RISKS ASSOCIATED WITH SUCH
 UNRECOMMENDED USE, STORAGE, OR DISPOSAL OF THE PRODUCT.

MATERIAL SAFETY DATA SHEET

SECTION 1. Product Identification

Manufacturer: General Refractories Co.
Address: 600 Grant St., Room 3000, Pittsburgh, PA 15219
Main Telephone Number: 412-562-6000
Emergency Telephone Number: 301-355-3400
Product Name, Sales Name or Trade Name: STEELKLAD B BIE
Product Type: Magnesite-Chromite Refractories

SECTION 2. Hazardous Ingredients

Chemical Name	Common Name	CAS Number	Per Cent**	OSHA PEL	ACGIH TLV	Carcinogen (Y/N)*
Ferro-chromite	(FeCr2O4)	12737-27-8	<20.0	(1)	(1)	No

Note: (1) Contains Cr(III) which is not listed as hazardous by NIOSH/OSHA. ACGIH TLV for Cr(III) is 0.5 mg/m3. The main ingredient in this product is sinter MgO which is not hazardous.

*Per NTP, IARC or OSHA lists. **On Phase Basis. ***Total Basis.

SECTION 3. Physical Data

Appearance: Brown-Black Brick Shape	Odor: Odorless
Specific Gravity: 3.10-3.25	Melting Point: Over 2200°C
Boiling Point: NI	Vapor Pressure: NI
Evaporation Rate: NI	Solubility in H2O: Insoluble
Solubility in Alcohol: Insoluble	Other Solvents: Strong acids
Percent Volatile by Vol.: NI	Vapor Density: NI

SECTION 4. Fire and Explosion Hazard Data

Flash Point (Method used): Nonflammable
Flammable Limits: LEL NA UEL NA
Extinguishing Media: Nonflammable
Special Fire Fighting Procedures: None
Unusual Fire and Explosion Hazards: None

Page 2

SECTION 5. Health Hazard Data

Primary Routes of Entry	Exposure Symptoms	Emergency Procedures
Inhalation	Cough, dyspnea, Black Sputum Pulm. Func., Fibrosis	Move to fresh air.
Ingestion	NE	NE
Skin Contact and Absorption	Irritation	Wash with water.
Eyes	Irritation	Flush with water.
Other Potential Health Risks	NE	NE

SECTION 6. Potential Exposure

When	Hazard Form
Installation	Dust from cutting brick.
Removal	Dust from tear-out after service.

SECTION 7. Corrosivity and Reactivity Data

Stability: Stable Polymerization: Will not occur

Incompatibility (materials to avoid): None

Decomposition Products: CO, CO₂, CH₄, H₂ and H₂O
from binder.

Conditions to be Avoided: Open flame and intense heat (if not
in service).

SECTION 8. Disposal Procedures

Spill or Leak Procedures: Clean up like any solid material.

Waste Disposal Method: Approved landfill in accordance with all federal, state and local regulations.

SECTION 9. Personal Protective Equipment/Procedures

Respiratory Protection: Yes

Type: NIOSH approved dust
respirator.

Ventilation--Local: NA

Mechanical(General): During handling, cutting, etc.

Other: NA

Protective Gloves: Non-porous gloves.

Eye Protection: Safety glasses or goggles.

Other Equipment: Steel toe shoes.

Action to be Taken During Repair and Maintenance of Equipment that has
been in Contact with this Product: Regular clean up.SECTION 10. Special Precautions

During Storage: None

Other: None

SECTION 11. Preparation/Revision
-----Date: 11/24/85

NA=Not Applicable

NI=No Information or Test Data

NE=Not Established



GENERAL REFRACTORIES COMPANY

~~CERRO COPPER PRODUCTS COMPANY
MSDS NUMBER: CERRO-00-0000
ENVIRONMENTAL HEALTH & SAFETY
0236~~

Customer:

Date: 2-11-91

Cerro Corp.
Cerro Copper Products
PO Box 66800
St. Louis, MO 63166
(For Sauget, Illinois)
Dear Customer,

This product contains a toxic chemical or chemicals as listed on MSDS form attached. It is subject to the reporting requirements of section 313-Title-111 of the superfund amendments and reauthorization act of 1986 and 40 CFR Part 372.

Product: SK-B-EE Tab BIE



AMAX
Minerals + Energy

CERRO COPPER PRODUCTS COMPANY
MSDS NUMBER - CCPC-00-0237

APPROVALS:
ENVIRONMENTAL / SAFETY / HEALTH / QUALITY

SULFURIC ACID

PRODUCT IDENTITY

EMERGENCY CONTACT

CHEMICAL NAME: Sulfuric Acid
TRADE NAME: None
FORMULA: H_2SO_4
CAS NO.: 7664-93-9
PHYSICAL FORM: Liquid

CORPORATE MANAGER OF INDUSTRIAL HYGIENE
AMAX INC.
AMAX CENTER
GREENWICH, CONNECTICUT 06836
TELEPHONE NO.: (203) 629-7112

COMPOSITION

MATERIAL	CAS NO.	%	PERMISSIBLE AIR LEVEL
Hydrogen Sulfate	7664-93-9	93	OSHA: 1 mg/m ³ ACGIH: 1 mg/m ³
Water		7	

HEALTH HAZARD INFORMATION

OSHA PERMISSIBLE EXPOSURE LEVEL: 1 mg/m³
ACGIH THRESHOLD LIMIT VALUE: 1 mg/m³

PRIMARY ROUTE OF ENTRY: Eye and skin contact, inhalation and ingestion.

SYMPTOMS AND EFFECTS OF:

ACUTE OVEREXPOSURE:

Inhalation of fumes or mist can result in irritation or burns to the upper respiratory tract and lungs. Pulmonary edema can also occur. Ingestion of this material will burn mouth, throat and stomach and can cause death. Eye or skin contact will result in serious burns and may cause blindness.

CHRONIC OVEREXPOSURE:

Erosion of the teeth, mouth inflammation, tracheo-bronchitis, conjunctivitis and skin lesions.

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY THIS MATERIAL: Chronic respiratory disease.

IS THIS MATERIAL CONSIDERED TO BE CARCINOGENIC BY:

NTP? No

IARC? No

OSHA? No

EMERGENCY AND FIRST AID PROCEDURES

Eye Contact: Immediately flush eyes with a large amount of water for at least 15 minutes (including under eyelids). Diluting and washing acid from the eyes must be done immediately to prevent permanent eye damage or blindness. Call a physician immediately.

Skin Contact: Immediately flush skin with a large amount of water. Remove clothing while under the safety shower. Call a physician immediately.

Inhalation: Remove to fresh air. If breathing has stopped, perform artificial respiration. Call a physician immediately.

Ingestion: Do not induce vomiting. If conscious, give several glasses of milk or water. Call a physician immediately. NOTE: Pulmonary edema may occur - monitor patient.

cc 2. 2-3-86

EXPOSURE CONTROL MEASURES

ENGINEERING: Use ventilation to maintain exposure levels of sulfuric acid mist or vapors within the OSHA limit. Maintain eyewash fountains and safety showers where sulfuric acid is used or stored.

PERSONAL PROTECTIVE EQUIPMENT: When required use a NIOSH/MSHA approved respirator. Elevated exposures may require the use of self-contained breathing equipment. Wear chemical safety goggles and full-face plastic shield. For increased protection use supplied air acid hood. DO NOT wear contacts. Wear acid-resistant apron, protective clothing, boots and gauntlet gloves for routine use. Acid-resistant trousers and jacket will provide increased protection.

REACTIVITY DATA

STABILITY: Sulfuric acid is stable.

INCOMPATIBILITY: With water, alkaline solutions, metals and strong oxidizing, reducing or combustible materials.

HAZARDOUS DECOMPOSITION PRODUCTS: Contact with cyanides, carbides and sulfides will produce hazardous gases. Sulfuric acid will release sulfur dioxide at extremely high temperatures.

HAZARDOUS POLYMERIZATION: Will not occur.

FIRE and EXPLOSION HAZARD DATA

FLASH POINT: Not applicable. **FLAMMABLE LIMITS:** LEL * UEL *

EXTINGUISHING MEDIA: Dry chemical or carbon dioxide. Do not add water or other liquid to acid. Explosive hydrogen gas can be generated inside metal drums or storage tanks.

SPECIAL FIRE FIGHTING PROCEDURES: Wear full protective clothing. Wear self-contained breathing equipment.

UNUSUAL FIRE AND EXPLOSION HAZARDS: Cool exterior of storage tanks and drums of H_2SO_4 with water if exposed to fire to avoid rupture. Do not get water or other liquids in acid.

*Do not apply

PRECAUTIONS FOR SAFE HANDLING AND USE

PRECAUTIONS FOR HANDLING AND STORAGE: Vent metal containers weekly or move frequently in hot weather to prevent hydrogen gas build-up. Store in a cool, ventilated area away from combustibles and reactive chemicals.

STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED: Neutralize with soda ash or lime. Adding soda ash will produce carbon dioxide - maintain adequate ventilation. Keep out of sewer.

WASTE DISPOSAL METHODS: Recover acid if possible. Dispose of in accordance with federal, state and local laws and regulations.

NOTE: THIS MATERIAL WAS REPORTED ON THE INITIAL TSCA INVENTORY.

PHYSICAL/CHEMICAL CHARACTERISTICS

BOILING POINT: 279°C	SPECIFIC GRAVITY ($H_2O=1$): 1.84
VAPOR PRESSURE @ 20°C: essentially 0	SOLUBILITY IN WATER: Complete
APPEARANCE AND ODOR: Colorless to light brown oily liquid. Odorless.	

DATE PREPARED: November 20, 1985

DATE REVISED: _____

MATERIAL SAFETY DATA SHEET

A-286
SUPERALLOY

I. PRODUCT IDENTIFICATION

Manufacturer's Name: Alpha Tool Works
 Address: 15100 Radius Place
 Santa Fe Springs, California 90670
 Telephone Number: (213) 921-9881
 Date: August 5, 1986
 Product Name: Extrusion Tool

CERRA COPPER PRODUCTS COMPANY
 MSDS NUMBER - CCPC-00-0038
 PREPARED BY: _____
 CHECKED BY: _____
 DATE: _____

II. INGREDIENTS

No permissible exposure limits (PEL) or threshold limit values (TLV) exist for steels.
 The following values are applicable to component elements:

Element	Weight Percentage	Number	OSHA PEL (mg/m ³)	ACGIH TLV (mg/m ³)
Carbon	0-2.25	1333-86-4	3.50 (As carbon black)	3.50 (As carbon black)
Chromium	0-17.00	7440-47-3	1.00	0.50
Iron	80.00-99.00	1309-37-1	10.00 (As iron oxide fume)	5.00 (As iron oxide fume)
Manganese	0-1.25	7439-96-5	5.00 (Ceiling limit dust)	5.00 (Ceiling limit dust) 1.00 (As fume)
Molybdenum	0-2.50	7439-98-7	5.00 (soluble compounds)	5.00 (soluble compounds)
Nickel	0-2.00	7440-02-0	1.00	0.10 (soluble compounds)
Silicon	0-2.00	7440-21-3	None	5.00 (Respirable Dust)
Sulfur	0-0.20	7446-09-5	None	5.00 (As sulfur Dioxide)
Tungsten	0-3.00	7440-33-7	None	1.00 (Soluble compounds)
Vanadium	0-2.00	1314-62-1	0.50 (Ceiling limit dust)	0.50 (As dust)
			0.10 (Ceiling limit fumes)	1.05 (As fume)

Some or various combinations of these components may appear in grades produced. Consult appropriate data sheets or test reports for the specific ordered analysis or contact Alpha Tool Works.

III. PHYSICAL DATA

Melting Point:	2400-2850°F
Specific Gravity:	7.5 - 8.5
Boiling Point:	N/A
Solubility in water:	Insoluble
Vapor Pressure:	N/A
Appearance and Odor	Solid, odorless metal. Metallic gray or lustre except when material is painted.

IV. FIRE AND EXPLOSION DATA

Flash Point	N/A
Flammability:	Lower Explosive Limit: N/A
	Upper Explosive Limit: N/A
Extinguishing Media:	N/A
Special Firefighting Procedures:	N/A

V. HEALTH HAZARD DATA

Steel products in the form shipped do not present an inhalation, ingestion or contact hazard. However, operations such as torch cutting, welding and grinding may result in the following effects if exposures exceed the limits listed in Section II, INGREDIENTS.

Effects of overexposure:

Acute:	Irritation of eyes, nose or throat, metallic taste in mouth, or metal fume fever. Possible dermatitis.
Chronic:	Prolonged over-exposure to alloy dusts or fumes may cause skin, eye, throat or nose irritations, leading to pulmonary diseases. Excessive and repeated inhalation of chromium and nickel fumes or dust may cause severe irritation, ulceration and increased risk of cancer in the respiratory system. Excessive and prolonged inhalation of manganese can cause central nervous system damage resembling a Parkinson-like syndrome.
First Aid:	Inhalation - remove to fresh air and get medical attention. Skin - wash areas well with soap and water. Eyes - flush well with running water to remove particles and get medical attention. Ingestion - in the unlikely event that large quantities of metal have been ingested, get medical attention.

VI. REACTIVITY DATA

Stability - Stable

Conditions to avoid - avoid generation of dust which can present a moderate fire and explosion hazard.

Incompatibility - molten metal will react violently with water.

VII. PERSONAL PROTECTION INFORMATION

Use general and local exhaust ventilation to keep airborne concentrations of dusts and fumes below the PEL's and TLV's of Section II. Employees should wear NIOSH or MSHA approved respirators for protection against dust or fumes. Food should not be consumed in the work area.

Full protective clothing should be worn by workers exposed to heavy concentrations of dust. Gloves and barrier creams may be necessary to prevent skin sensitization and dermatitis.

Approved safety glasses with sideshields or goggles should be worn during operations creating eye hazards. A welding hood should be worn when welding or burning.

Approved steel-toe shoes with metatarsal guards should be worn for foot protection.

VIII. SPILL OR LEAK PROCEDURES

Action to take for spills - N/A

Waste disposal methods - N/A

IX. SPECIAL PRECAUTIONS

Adequate ventilation and/or respiratory protection should be provided if exposure limits in Section II, INGREDIENTS are exceeded.

Use good housekeeping practices to prevent accumulation of dust and fume and keep airborne dust and fume away.

All information, recommendations and suggestions contained herein are based upon data believed to be correct. However, no guarantee or warranty of any kind, expressed or implied, is made by Alpha Tool Works with respect to the information provided.

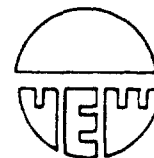
Employers should use this information only as a supplement to other available data. Since the use of these steel products is beyond our control, it is each employer's responsibility to assure the safety and health of their employees. Alpha Tool Works will not assume liability arising out of use of this product by others.

BOHLER BROS. OF AMERICA, INC.*Specialty Steels and Products*

Avon Industrial Park, 40 Robbie Road, Avon, MA 02322

Telephone (617) 588-1150

Telex 94-0535


 CERRO COPPER PRODUCTS COMPANY
 MSDS NUMBER: CCPC-00-0207
MATERIAL SAFETY DATA
 ENVIRONMENTAL: _____
 HEALTH: _____
 PHYSICAL: _____
I. PRODUCT INFORMATION

Company: Bohler Bros. of America, Inc.

Issue Date: November 22, 1985

Product Groups: Carbon, Alloy, Tool, High Speed and Stainless Steel

Product Forms: Bar, Sheet, Plate, Strip, Section, Forging, Tubing and Structurals

II. HAZARDOUS INGREDIENTS
 Component Elements, CAS Number, % Weight and Permissible Exposure Limits as determined by
 OSHA and ACGIH for each component:

Material/Component	CAS Number	% Wt.	Exposure Limits	
			OSHA PEL (mg/m ³)	ACGIH TLV (mg/m ³)
Base Metal				
Iron (Fe)	7439-89-6	Balance	10(Fe ₂ O ₃ Fume)	5.0 (Fe ₂ O ₃ Fume)
Alloying Elements				
Aluminum (Al)	7429-90-5	< 2.00	None Listed	5.0 as welding fume
Carbon (C)	7440-44-0	< 3.00	None Listed	None Listed
Chromium (Cr)	7440-47-3	< 35.00	1.0 as chrome	0.5 as chrome
Cobalt (Co)	7440-48-4	< 12.00	1.0 as cobalt & fume	0.05 as fume
Copper (Cu)	7440-50-8	< 4.50	0.2 as copper;	0.2 as fume; 1.0 as dust
Manganese (Mn)	7439-96-5	< 20.00	5 as manganese	5 as dust; 1 as fume
Molybdenum (Mo)	7439-98-7	< 10.00	15 as insoluble compds	10 as insoluble compds
Nickel (Ni)	7440-02-0	< 35.00	1.0 as Nickel	1.0 as Nickel
Phosphorous (P)	7723-14-0	< 0.20	0.1 as Phosphorous	0.1 as Phosphorous
Silicon (Si)	7440-21-3	< 3.00	None Listed	10 total dust
Sulphur (S)	7704-34-9	< 0.40	13 sulfur dioxide	5 sulfur dioxide
Titanium (Ti)	7440-32-6	< 2.50	15 titanium dioxide	5.0 titanium dioxide
Tungsten (W)	7440-33-7	< 19.00	None Listed	5 insoluble compounds
Vanadium (V)	7440-62-2	< 6.50	0.5 dust; 0.1 fume	0.50 dust and fume
Zinc (Zn) Coating	1314-13-2	< 10.00	5.0 as fume	5.0 as fume

Note: The above listing is a summary of elements used in alloying steel. Various grades of steel will contain different combinations of these elements. Trace elements may also be present in minute amounts.

MATERIAL SAFETY DATA SHEET, Continued

III. PHYSICAL DATA

Material is (at normal Conditions):
O Liquid ● Solid O Gas O Other

Appearance and Odor:
Gray-Black with Metallic Luster -
Odorless

Acidity/Alkalinity - pH = NA

Melting Point - Approx. 2750°F

Specific Gravity (H₂O = 1) - 7

Boiling Point - NA

Solubility in water (% by weight) - NA

Vapor Pressure (mm Hg at 20°C) - NA

IV. PERSONAL PROTECTIVE EQUIPMENT

Respiratory Protection:
NIOSH approved dust/mist/fume respirator
should be used during welding or burning if
OSHA PEL or TLV is exceeded.

Hands, Arms and Body:
Use appropriate protective clothing, such
as welders aprons and gloves when welding
or burning. Check local codes.

Eyes and Face:
Safety glasses should always be worn when
grinding or cutting; face shields should be
worn when welding or burning.

Other Clothing and Equipment:
As required.

V. EMERGENCY MEDICAL PROCEDURES

Inhalation: Remove to fresh air; if condition continues, consult physician.

Eye Contact: Immediately flush well with running water to remove particulate; get medical attention.

Skin Contact: If irritation develops, remove clothing and wash well with soap and water. If condition persists, seek medical attention.

Ingestion: If significant amounts of metal are ingested, seek medical attention.

VI. HEALTH/SAFETY INFORMATION

HEALTH

Steel products in the natural state do not present an inhalation, ingestion or contact health hazard. However, operations such as welding, burning, sawing, brazing, grinding and possibly machining, which results in elevating the temperature of the product to or above its melting point or results in the generation of airborne particulates may present hazards. The above operations should be performed in well ventilated areas. The major exposure hazard is inhalation.

MATERIAL SAFETY DATA SHEET, Continued

Effects of overexposure are as follows:

Acute: Excessive inhalation of metallic fumes and dusts may result in irritation of eyes, nose and throat. Also high concentrations of fumes and dusts of iron-oxide, manganese, copper, zinc and lead may result in metal fume fever. Typical symptoms consist of a metallic taste in the mouth, dryness and irritation of the throat, chills and fever, and usually last from 12 to 48 hours.

Chronic: Chronic and prolonged inhalation of high concentrations of fumes or dust of the following elements may lead to the conditions listed opposite the element:

Iron (iron-oxide) - Pulmonary effects

Manganese - Bronchitis, pneumonitis, lack of coordination.

Chromium - Various forms of dermatitis, inflammation and/or ulceration of upper respiratory tract, and possibly cancer of nasal passages and lungs. Based on available information, there does not appear to be any evidence the exposure to welding fume induces human cancer.

Nickel - Same as Chromium.

Copper - Pulmonary effects.

Vanadium - No reported cases of exposure to vanadium.

Cobalt - Inhalation of cobalt dust may cause an asthma-like disease with cough and dyspnea.

Molybdenum - Pain in joints, hands, knees and feet.

Tungsten - Some evidence of pulmonary involvement, such as cough.

Lead - Prolonged exposures can cause behavioral changes, kidney damage, periphery neuropathy characterized by decreased hand-grip strength and adverse reproductive effects.

Zinc - None reported.

Occupational Exposure Limits: See Section II

FIRE AND EXPLOSION

Flash Point - NA Auto Ignition Temp. - NA

Flammable Limits in Air:

Extinguishing Media - NA

Lower NA %

Upper NA %

Fire and Explosion Hazards - None

Extinguishing Media Not to be Used - NA

REACTIVITY

Stability:

● Stable ○ Unstable

Incompatibility (Materials to Avoid):

Reacts with strong acids to form hydrogen gas

Conditions to Avoid -

Keep Area Well Ventilated

Avoid non-ventilated areas when cutting, welding, burning or brazing; avoid generation of airborne dusts and fumes.

Hazard Decomposition Products - Metallic oxides.

MATERIAL SAFETY DATA SHEET, Continued

VII. ENVIRONMENTAL

Spill or Leak Procedures: NA. Special Precautions: Use good housekeeping practices to prevent accumulation of dust and to keep airborne dust to a minimum.

Waste Disposal Method: Dust, etc. - follow federal, state and local regulations regarding disposal.

VIII. ADDITIONAL INFORMATION

Disclaimer:

The information in this MSDS was obtained from sources which we believe are reliable. However, the information is provided without any representation or warranty, express or implied, regarding the accuracy or correctness. The conditions or methods of handling, storage, use and disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of the product.

SUREBOND MORTAR

COMBUSTION ENGINEERING, INC.

CORPORATE HEALTH & SAFETY
WINDSOR, CT
Phone: (203) 285-9693MANUFACTURER: C-E Refractories
ADDRESS: P. O. Box 828
Valley Forge, PA 19482
Phone: (215) 337-1100CERRO COPPER PRODUCTS COMPANY
MSDS NUMBER - CCPC-00-0241

APPROVALS:

ENVIRONMENTAL: (PRICE) _____
SAFETY: (PRICE) _____
PURCHASING: (PRICE) _____**SECTION I, MATERIAL IDENTIFICATION**

Material Name	SUREBOND [®] MORTAR
Types:	Soupy, SRM, Winterized
CAS Registry #	Not Applicable
Chemical Analysis	SiO ₂ , Al ₂ O ₃ , NaO, K ₂ O

SECTION II, INGREDIENTS AND HAZARDS

SUREBOND[®] MORTAR is a silica-alumina based refractory mortar in a sodium silicate suspension. This product contains more than 1% crystalline silica (free silica) and up to 1% ethylene glycol. The current OSHA permissible exposure limit (PEL) for respirable crystalline silica dust is 10 mg/m³ divided by percent free silica plus two, averaged over an 8-hour workshift. OSHA has not established a PEL for ethylene glycol. This product dries after usage. When this product is removed after its useful life (tear out), dust generation is likely. The user should be warned of the current PEL and precautions should be taken to avoid inhalation of dust, (see Section IX, Special Precautions and Comments).

This product does not contain any substances listed in the National Toxicology Program "Annual Report on Carcinogens" (1983) nor the International Agency for Research on Cancer Monographs, nor by OSHA.

SECTION III, PHYSICAL DATA

Odorless light gray suspension of fine grain aggregate, supplied in a variety of wet consistencies ranging from a thin paint to a thick mud.

SECTION IV, FIRE AND EXPLOSION DATA

This material is non-combustible. Use extinguishing media appropriate to the surrounding area.

SECTION V, REACTIVITY DATA

Material is air setting. Keep in sealed containers until ready to use and reseal partially used containers.

least (a) 14
to be washed off
to the skin on
SOUP, SKIN
MORTAR, SOUP, SKIN
©

SECTION V - HEALTH HAZARD DATA

INGESTION	INHALATION
CARCINOGENIC NO	THRESHOLD LIMIT VALUE NOT ESTABLISHED
EFFECTS OF OVEREXPOSURE MILD SKIN IRRITATION WITH CONTINUED EXPOSURE. IRRITATION OR INJURY TO RESPIRATORY TRACT. BURNING IN MOUTH, ABDOMINAL PAIN. SEVERE EXPOSURE TO BN DUST MAY PRODUCE PNEUMOCONIOSIS. MAY CAUSE EYE DAMAGE. MILDLY ACIDIC, pH=2 to 3.	
EMERGENCY AND FIRST AID PROCEDURES: FLUSH EYES WITH WATER FOR AT LEAST 15 MINUTES. REMOVE CONTAMINATED CLOTHING AND WASH CONTAMINATED AREAS OF THE BODY WITH SOAP AND WATER. IF INGESTED, GIVE FLUIDS IN LARGE QUANTITIES. IF INHALED, REMOVE TO FRESH AIR AND TREAT SYMPTOMS. IF INGESTED OR INHALED, SEEK PROMPT MEDICAL ATTENTION.	

SECTION VI - SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED	CONTAIN, ABSORB ONTO A NON-FLAMMABLE ABSORBANT MATERIAL AND DISPOSE OF AS DIRECTED BELOW.
WASTE DISPOSAL METHOD	CONSULT LOCAL, STATE AND FEDERAL REGULATIONS. THIS MATERIAL IN LIQUID FORM IS MILDLY ACIDIC, pH=2 to 3.

SECTION VII - SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION (Specify type) IF SPRAYED, USE MSHA/NIOSH APPROVED RESPIRATOR.		
VENTILATION	LOCAL EXHAUST MECHANICAL (General) IF SPRAYED USE APPROVED SPRAY BOOTH	SPECIAL OTHER
PROTECTIVE GLOVES	RUBBER	EYE PROTECTION GOGGLES
OTHER PROTECTIVE EQUIPMENT PROTECTIVE CLOTHING		

SECTION VIII - SPECIAL PRECAUTIONS FOR SAFE HANDLING

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING	STORE IN ORIGINAL CONTAINER. AVOID USE OF MATERIALS OR EQUIPMENT SENSITIVE OR REACTIVE WITH ACIDIC SOLUTIONS.
OTHER PRECAUTIONS	WHEN DRIED AND UNDER DUSTING CONDITIONS, NOTE EFFECT OF OVER- EXPOSURE WITH BORON NITRIDE CONTAINING PRODUCTS CITED ABOVE.

MATERIAL SAFETY DATA SHEET

The purpose of this data sheet is to obtain technical information required to evaluate health, safety and environmental recommendations for use of the material. The information is only as necessary to meet requirements of the Occupational Safety and Health Act or other Federal, State or Local regulations.

CERRO COPPER PRODUCTS COMPANY
MSDS NUMBER - CCPC-00-0242

SECTION I

SUPPLIER'S NAME Matter Incorporated		EMERGENCY TELEPHONE NO. 1-314-677-4301
ADDRESS (NUMBER STREET CITY STATE and ZIP CODE) 2337 Gloucester High Ridge, Mo. 63049		
CHEMICAL NAME AND SYNONYMS Detergent		TRADE NAME AND SYNONYMS Swipe Cleaner No. 129
CHEMICAL FAMILY Hard surface cleaner	FORMULA Proprietary	

SECTION II — HAZARDOUS INGREDIENTS —

PAINTS, PRESERVATIVES & SOLVENTS	%	TLV (UNITS)	ALLOYS and METALLIC COATINGS	%	TLV (UNITS)
Pigments			Base Metal		
Catalyst			Alloys		
Vehicle			Metallic Coatings		
Solvents Ethylene glycol mono butyl ether	3		Filler Metal Plus Coating or Core Flux		
Additives sodium meta silicate	2		Others		
Others Potassium hydroxide	6.5				

HAZARDOUS MIXTURES OF OTHER SOLVENTS

	%	TLV (UNITS)
None		

SECTION III — PHYSICAL DATA

Boiling Point (°F)	215 F	Specific Gravity (H ₂ O = 1)	1.1
Vapor Pressure (mm Hg.)	N/D	Percent Volatile by Volume (%)	80
Vapor Density (Air = 1)	N/D	Evaporation Rate (1 = 1)	
Solubility in Water	complete	Appearance and Odor	pink liquid, clear

SECTION IV — FIRE AND EXPLOSION HAZARD DATA

Flash Point (Method Used)	None	Flammable Limits	N/A
Extinguishing Media	N/A		
Special Fire Fighting Procedures			
Unusual Fire and Explosion Hazards			

SECTION V — HEALTH HAZARD DATA

Threshold Limit Value **N/D**contact with concentrated solution may cause burns to human tissue
Effects of Overexposure Ingestion: damages throat area and gastro respiratory tract.Take lots of water or fruit juices. do not induce vomiting. Seek medical attention.
Eyes: Flush with water at least 15 min. consult physician. Skin. Flush with water.

Emergency and First Aid Procedures

SECTION VI — REACTIVITY DATA

Stability	Unstable		Conditions to Avoid
	Stable	X	

Incompatibility (Materials to avoid)

Aluminum, Tin, Lead, Zinc and other alloys

Hazardous Decomposition Products

Hazardous	May Occur		Conditions to Avoid
Polymerization	Will Not Occur	X	

SECTION VII — SPILL OR LEAK PROCEDURES

Steps to be Taken in Case Material is Released or Spilled

Dike and absorb with inert material.

Waste Disposal Method

Transfer to container for disposal.

SECTION VIII — SPECIAL PROTECTION INFORMATION

Respiratory Protection (Specify type)

Ventilation	Local Exhaust	acceptable	Special
	Mechanical (General)		Other

Protective Gloves

Yes

Eye Protection

Splash proof goggles

Other Protective Equipment

SECTION IX — SPECIAL PRECAUTIONS

Precautions to be Taken in Handling and Storing

Protect from freezing Keep out of reach of children

Other Precautions

U.S. DEPARTMENT OF LABOR
Occupational Safety and Health Administration

Form Approved
OMB No. 44-R1387

MATERIAL SAFETY DATA SHEET

CERRO COPPER PRODUCTS COMPANY
MSDS NUMBER - CCPC-00-0240

Tap Magic

Required under
Shipbuilding

MANUFACTURER'S NAME

THE STECO CORPORATION

EMERGENCY TELEPHONE NO.

501 375-5644

ADDRESS (Number, Street, City, State, and ZIP Code)

P. O. Box 2238, Little Rock, Arkansas 72203

CHEMICAL NAME AND SYNONYMS

Proprietary

TRADE NAME AND SYNONYMS

TAP MAGIC

CHEMICAL FAMILY

Proprietary

FORMULA

Proprietary

SECTION II - HAZARDOUS INGREDIENTS

PAINTS, PRESERVATIVES, & SOLVENTS	%	TLV (Units)	ALLOYS AND METALLIC COATINGS	%	TLV (Units)
PIGMENTS			BASE METAL		
CATALYST			ALLOYS		
VEHICLE			METALLIC COATINGS		
SOLVENTS			FILLER METAL PLUS COATING OR CORE FLUX		
ADDITIVES			OTHERS		
OTHERS					
HAZARDOUS MIXTURES OF OTHER LIQUIDS, SOLIDS, OR GASES				%	TLV (Units)
1,1,1 - Trichloroethane Over 85%					350 ppm
Proprietary - less than 15%					NA
Quantities involved are so small as to preclude the possibility of any ill effects					
Product does not contain Nitrosamine.					

SECTION III - PHYSICAL DATA

BOILING POINT (°F.)	185	SPECIFIC GRAVITY (H ₂ O=1)	1.3
VAPOR PRESSURE (mm Hg.) 145 @	25°C	PERCENT VOLATILE BY VOLUME (%)	98+
VAPOR DENSITY (AIR=1)	4.5	EVAPORATION RATE (_____=1)	.5 gal/ft ² /day
SOLUBILITY IN WATER	Ins		
APPEARANCE AND ODOR Amber liquid and pleasant odor			

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (Method used) None (open cup)	FLAMMABLE LIMITS	LeI	UeI
EXTINGUISHING MEDIA None			
SPECIAL FIRE FIGHTING PROCEDURES None			
UNUSUAL FIRE AND EXPLOSION HAZARDS None			

SECTION V - HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE
MAC - 350 ppm

EFFECTS OF OVEREXPOSURE
Sleepiness

EMERGENCY AND FIRST AID PROCEDURES
Fresh air

SECTION VI - REACTIVITY DATA

STABILITY	UNSTABLE		CONDITIONS TO AVOID
	STABLE	X	

INCOMPATIBILITY (Materials to avoid)

HAZARDOUS DECOMPOSITION PRODUCTS

HAZARDOUS POLYMERIZATION	MAY OCCUR		CONDITIONS TO AVOID
	WILL NOT OCCUR	X	

SECTION VII - SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED
Ventilation

WASTE DISPOSAL METHOD
Volatile

SECTION VIII - SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION (Specify type)

VENTILATION	LOCAL EXHAUST	SPECIAL
	MECHANICAL (General)	OTHER

PROTECTIVE GLOVES Not required	EYE PROTECTION Not required
-----------------------------------	--------------------------------

OTHER PROTECTIVE EQUIPMENT
Not required

SECTION IX - SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING
None

OTHER PRECAUTIONS
Do not use on aluminum because of possible corrosive effects.

U.S. DEPARTMENT OF LABOR
Occupational Safety and Health Administration

Form Approved
OMB No. 44-R1387

MATERIAL SAFETY DATA SHEET

CERRA CORP. PRODUCTS COMPANY
MSDS NUMBER - C0PC-00-0244

Tap Magic Aluminum

Required ur
Shipt

ENVIRONMENTAL: _____

MANUFACTURER'S NAME

THE STECO CORPORATION

EMERGENCY TELEPHONE NO.

5 01 375 5644

ADDRESS (Number, Street, City, State, and ZIP Code)

P. O. Box 2238, Little Rock, Arkansas 72203

CHEMICAL NAME AND SYNONYMS

Proprietary

TRADE NAME AND SYNONYMS

TAP MAGIC ALUMINUM

CHEMICAL FAMILY

Proprietary

FORMULA

Proprietary

SECTION II - HAZARDOUS INGREDIENTS

PAINTS, PRESERVATIVES, & SOLVENTS	%	TLV (Units)	ALLOYS AND METALLIC COATINGS	%	TLV (Units)
PIGMENTS			BASE METAL		
CATALYST			ALLOYS		
VEHICLE			METALLIC COATINGS		
SOLVENTS			FILLER METAL PLUS COATING OR CORE FLUX		
ADDITIVES			OTHERS		
OTHERS					
HAZARDOUS MIXTURES OF OTHER LIQUIDS, SOLIDS, OR GASES				%	TLV (Units)
C ₉ - C ₁₆ Hydrocarbons of the methane series				60	2000
Product does not contain Nitrosamine.					

SECTION III - PHYSICAL DATA

BOILING POINT (°F.)	Initial	283 F	SPECIFIC GRAVITY (H ₂ O=1)	0.824
VAPOR PRESSURE (mm Hg.)	L5 @	25°	PERCENT, VOLATILE BY VOLUME (%)	Ambient 5%
VAPOR DENSITY (AIR=1)		5.8	EVAPORATION RATE (_____=1)	Very Slow
SOLUBILITY IN WATER		Ins		
APPEARANCE AND ODOR	Pale yellow liquid - pleasant odor			

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (Method used)	Open cup 189°F	FLAMMABLE LIMITS	0.6 - 2.6%	LeI	UeI
EXTINGUISHING MEDIA	Form CO ₂ - Dry Chemical Agents				
SPECIAL FIRE FIGHTING PROCEDURES	None				
UNUSUAL FIRE AND EXPLOSION HAZARDS	None				

SECTION V - HEALTH HAZARD DATA	
THRESHOLD LIMIT VALUE 1000 - 2000 ppm	
EFFECTS OF OVEREXPOSURE Mild transient euphoria	
Ingestion - local irritation	
EMERGENCY AND FIRST AID PROCEDURES Fresh air - supportive treatment	
If ingester, do not give emetics	

SECTION VI - REACTIVITY DATA			
STABILITY	UNSTABLE		CONDITIONS TO AVOID
	STABLE	X	Extreme heat
INCOMPATIBILITY (Materials to avoid)			
HAZARDOUS DECOMPOSITION PRODUCTS			
HAZARDOUS POLYMERIZATION	MAY OCCUR		CONDITIONS TO AVOID
	WILL NOT OCCUR	X	

SECTION VII - SPILL OR LEAK PROCEDURES	
STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED Absorb with inert material - sawdust	
WASTE DISPOSAL METHOD Incinerate	

SECTION VIII - SPECIAL PROTECTION INFORMATION			
RESPIRATORY PROTECTION (Specify type) None			
VENTILATION	LOCAL EXHAUST	X	SPECIAL
	MECHANICAL (General)		OTHER
PROTECTIVE GLOVES Not required		EYE PROTECTION Not required	
OTHER PROTECTIVE EQUIPMENT Not required			

SECTION IX - SPECIAL PRECAUTIONS	
PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING None	
OTHER PRECAUTIONS None	

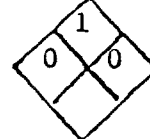
Thermal moly

To Baker

U.S. DEPARTMENT OF LABOR
Occupational Safety and Health Administration

Form Approved
OMB No. 44-R1387

MATERIAL SAFETY DATA SHEET
CERRA COPPER PRODUCTS COMPANY
HDSB NUMBER - CCPC-00-0245



ENVIRONMENTAL: _____ p Repairing,
HAZARD: _____ 1917)
PROCESSING: _____

SECTION I Amended: September, 1985

MANUFACTURER'S NAME
Royal Oil CompanyEMERGENCY TELEPHONE NO.
(817) 332-7001

ADDRESS (Number, Street, City, State, and ZIP Code)

P. O. Box 646, Ft. Worth, Texas 76101

CHEMICAL NAME AND SYNONYMS

N/A

TRADE NAME AND SYNONYMS

Thermal Moly

CHEMICAL FAMILY

Petroleum Hydrocarbon

FORMULA

Mixture

SECTION II - HAZARDOUS INGREDIENTS

PAINTS, PRESERVATIVES, & SOLVENTS	%	TLV (Units)	ALLOYS AND METALLIC COATINGS	%	TLV (Units)
PIGMENTS			BASE METAL		
CATALYST			ALLOYS		
VEHICLE			METALLIC COATINGS		
SOLVENTS			FILLER METAL PLUS COATING OR CORE FLUX		
ADDITIVES			OTHERS		
OTHERS					
HAZARDOUS MIXTURES OF OTHER LIQUIDS, SOLIDS, OR GASES				%	TLV (Units)
Under normal conditions of use, the oil in this product can not be					
mistled and the molybdenum disulfide cannot be dusted,					
therefore should cause no health problems.					

SECTION III - PHYSICAL DATA

BOILING POINT (°F.)	> 500	SPECIFIC GRAVITY (H ₂ O=1)	0.8897
VAPOR PRESSURE (mm Hg.)	< 1	PERCENT VOLATILE BY VOLUME (%)	Negligible
VAPOR DENSITY (AIR=1)	> 15	EVAPORATION RATE (_____ =1)	< 1
SOLUBILITY IN WATER	Negligible		
APPEARANCE AND ODOR	Smooth, grayish-black grease with mild petroleum hydrocarbon odor.		

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (Method used)	> 500°F. (COC)	FLAMMABLE LIMITS	Not Determined	LeI	UeI
EXTINGUISHING MEDIA	CO ₂ , Foam, Dry Chemical				
SPECIAL FIRE FIGHTING PROCEDURES	Use air-supplied breathing equipment for enclosed areas.				
	Cool exposed containers with water spray.				
UNUSUAL FIRE AND EXPLOSION HAZARDS	Do not store with strong oxidants.				

SECTION V - HEALTH HAZARD DATA	
THRESHOLD LIMIT VALUE	Not Established
EFFECTS OF OVEREXPOSURE Skin (prolonged or repeated contact): may cause mild irritation.	
Eyes: mild, transient irritation.	Carcinogens: None Known
EMERGENCY AND FIRST AID PROCEDURES Skin: wash thoroughly with soap and warm water. Eyes: flush with clear water for 15 minutes or until irritation subsides. Call physician if irritation persists.	
Ingestion: give liquids, induce vomiting, call a physician.	

SECTION VI - REACTIVITY DATA			
STABILITY	UNSTABLE		CONDITIONS TO AVOID: None Known
	STABLE	X	
INCOMPATIBILITY (Materials to avoid) Strong Oxidizers			
HAZARDOUS DECOMPOSITION PRODUCTS Oxides of carbon and sulfur, in case of combustion.			
HAZARDOUS POLYMERIZATION	MAY OCCUR		CONDITIONS TO AVOID: None Known
	WILL NOT OCCUR	X	

SECTION VII - SPILL OR LEAK PROCEDURES	
STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED Clean up with mechanical equipment. Then, if applicable, wash area with detergent and water.	
WASTE DISPOSAL METHOD	Federal, State and/or Local approved for an oil base material.

SECTION VIII - SPECIAL PROTECTION INFORMATION			
RESPIRATORY PROTECTION (Specify type)		Not required under normal conditions	
VENTILATION	LOCAL EXHAUST	Not required	SPECIAL N/A
	MECHANICAL (General)	Not required	OTHER N/A
PROTECTIVE GLOVES		Not required	EYE PROTECTION
OTHER PROTECTIVE EQUIPMENT		Not required	

SECTION IX - SPECIAL PRECAUTIONS	
PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING	Do not store at temperatures above 150°F.
OTHER PRECAUTIONS	Observe good personal hygiene practice when handling lubricant.

THIOURER - HENLEY + SONS
KALTRON, INC
G.S. ROBINS

CERRO COPPER PRODUCTS
COMPANY - - - SAUGET, IL
MSDS NUMBER ASSIGNED
CCPC-00-0246

00 -
0246

MATERIAL SAFETY DATA SHEET

THE EMERGENCY PHONE NUMBER IS: (212) 599-1333

PAGE 1 OF 4

SECTION I		IDENTIFICATION		VERSION DATE: 08/02/84	
PRODUCT NAME: THIOUREA					
CHEMICAL SYNONYMS:					
CHEMICAL FAMILY:					
PRODUCT CODE: 1161250070			GAS NUMBER: 00062-56-6		
SECTION II		HAZARDOUS INGREDIENTS			
INGREDIENT		PCNT	HAZARD DATA		
NONE					
SECTION III		PHYSICAL DATA			
MELTING POINT:		SOLUBILITY IN WATER:		VISCOSITY:	
220°C		220°C			
BOILING POINT:		PH: 13.6 G/L		DROP POINT:	
DENSITY:		% VOLATILE:		IGNITION TEMPERATURE:	
220°C				440 °C	
SPECIFIC GRAVITY:		EVAPORATION RATE:		REFRACTIVE INDEX:	
1.405 G/ML					
DECOMPOSITION TEMP:		VAPOR PRESSURE:		FREEZING POINT:	
176-177 °C					
ACID NUMBER:		VAPOR DENSITY:			
APPEARANCE AND ODOR:					
WHITE CRYSTALLINE MATERIAL					
SECTION IV		FIRE AND EXPLOSION HAZARDS			
FLASH POINT		EXPLOSIVE LIMIT		LOWER	UPPER
VALUE	SCALE METHOD				



MATERIAL SAFETY DATA SHEET

PAGE 2 OF 4

PRODUCT NAME: THIOUREA

SECTION IV, CONT. FIRE AND EXPLOSION HAZARDS

EXTINGUISHING MEDIA:
CARBON DIOXIDE, WATER SPRAY, FOAM OR DRY CHEMICAL.

SPECIAL PROCEDURES:
USE SELF-CONTAINED BREATHING APPARATUS.

UNUSUAL HAZARDS:
EMITS HIGHLY TOXIC FUMES UNDER FIRE CONDITIONS.

SECTION V HEALTH INFORMATION

EFFECTS OF OVEREXPOSURE:
IRRITANT TO SKIN.
DEPRESSANT OF BONE MARROW WITH ANEMIA, INHIBITS IODINE RECEPTION,
RETARDS BLOOD COAGULATION, DERMATITIS, ECZEMA, SKIN SENSITIZATION AND
THYROID ENLARGEMENT.

TOXICITY: TEST	DOSE	UPPER LIMIT	U/M	DURATION
ORL-RAT	LD50	1750	MG/KG	
DML-RBT	LD50	>2800	MG/KG	
IHL-RAT	LC50	2170	MG/M3	

POSSIBLE CANCER HAZARD BASED ON TESTS WITH LABORATORY ANIMALS.

SECTION VI OCCUPATIONAL EXPOSURE LIMITS

THRESHOLD LIMIT- PPM- MG/CMB-

TEXT:
NOT ESTABLISHED.

SECTION VII EMERGENCY AND FIRST AID PROCEDURE

INHALATION:
CONSULT PHYSICIAN IF IRRITATION OF RESPIRATORY PASSAGES OCCURS.

EYE CONTACT:
FLUSH THOROUGHLY WITH WATER FOR 15 MINUTES. GET IMMEDIATE MEDICAL HELP.



MATERIAL SAFETY DATA SHEET

PAGE 3 OF 4

PRODUCT NAME: ETHIOUREA

SECTION VII, CONT. EMERGENCY AND FIRST AID PROCEDURES

SKIN CONTACT:
IMMEDIATELY REMOVE CONTAMINATED CLOTHING AND WASH AFFECTED AREA THOROUGHLY WITH SOAP AND WATER.

INGESTION:
GIVE LARGE AMOUNTS OF WATER.
GET IMMEDIATE MEDICAL HELP.

ADDITIONAL MEASURES:
ADMINISTER ARTIFICIAL RESPIRATION IF BREATHING HAS STOPPED.
CONTACT LENSES SHOULD NOT BE WORN WHEN WORKING WITH THIS CHEMICAL.

SECTION VIII REACTIVITY DATA

CHEMICAL STABILITY

☐ UNSTABLE, ☒ STABLE

HAZARDOUS POLYMERIZATION

☐ MAY OCCUR, ☒ WILL NOT OCCUR

CONDITIONS TO AVOID:

HAZARDOUS DECOMPOSITION PRODUCTS:

SECTION IX SPILL OR LEAK PROCEDURES

SPILL OR LEAK PROCEDURES:
COLLECT INTO SUITABLE CONTAINER.

WASTE DISPOSAL:
DISPOSE OF OR INCINERATE IN ACCORDANCE WITH LOCAL REGULATIONS.
LISTED AS A HAZARDOUS SUBSTANCE, AS DEFINED IN THE COMPREHENSIVE ENVIRONMENTAL RESPONSE, COMPENSATION, AND LIABILITY ACT OF 1980.



MATERIAL SAFETY DATA SHEET

PAGE 4 OF 4

PRODUCT NAME: THIOUREA

SECTION X EMPLOYEE PROTECTION:

**RESPIRATORY PROTECTION:
DUST MASK RECOMMENDED.**

**PROTECTIVE CLOTHING:
CLOTHING SUITABLE TO PREVENT SKIN CONTACT.
SAFETY GLASSES.
RUBBER GLOVES.**

**ADDITIONAL MEASURES:
USE LOCAL VENTILATION.**

SECTION XI SPECIAL PRECAUTIONS

NONE

SECTION XII TRANSPORTATION AND OTHER REGULATORY REQUIREMENTS

**DOT PROPER SHIPPING NAME:
THIOUREA**

**DOT CLASSIFICATION
HAZARDOUS SUBSTANCE, LIQUID OR SOLID, NOS/ORM-E
UN/NA:**

OTHER DOT REQUIREMENTS:

OTHER REGULATORY CONTROLS:



ENVIRONMENTAL DATA
REVISION
DATE
BY

271-0467 CHARLIN
HARRIS AUBA

MATERIAL SAFETY DATA SHEET CLAYTON CHEMICAL COMPANY

EFFECTIVE DATE: JUNE 1, 1988

PRODUCT NAME: RECYCLED TRICHLOROETHYLENE

INGREDIENTS (TYPICAL VALUES-NOT SPECIFICATIONS) : %:

TRICHLOROETHYLENE (NOMINAL) : 97%:

SECTION 1

PHYSICAL DATA

BOILING POINT: 189F (87C)
VAP PRESS: 60 MMHG AT 20C
VAP DENSITY (AIR=1): 4.53

: SOL. IN WATER: 0.1 G/100G AT 25C
: SP. GRAVITY: 1.46 AT 5/25C
: % VOLATILE BY VOL: 100 (ESSENT)

APPEARANCE AND ODOR: COLORLESS LIQUID.

SECTION 2

FIRE AND EXPLOSION HAZARD DATA

FLASH POINT: NONE
METHOD USED: TCC

: FLAMMABLE LIMITS
: LFL: 7.8VOL% 100CUFL: 52 VOL% 100C

EXTINGUISHING MEDIA: WATER FOG.

8.0 VOL% 25C 10.5 VOL% 25C

SPECIAL FIRE FIGHTING EQUIPMENT AND HAZARDS: Pressure demand self-contained respiratory protection. Strong unpleasant odor. Not considered a flammable liquid under normal industrial use conditions. Autoignition temperature is 788F, 420C.

SECTION 3

REACTIVITY DATA

STABILITY: Avoid open flames, welding arcs, or other high temperature sources which induce thermal decomposition.

INCOMPATIBILITY: Strong bases: Caustic Soda, Caustic Potash.

HAZARDOUS DECOMPOSITION PRODUCTS: Involvement in fire forms hydrogen chloride and very small amounts of phosgene & chlorine.

HAZARDOUS POLYMERIZATION: Will not occur.

SECTION 4

SPILL, LEAK, AND DISPOSAL PROCEDURES

ACTION TO TAKE FOR SPILLS: SMALL SPILLS:

Mop up, wipe up or soak up immediately. Remove to out of doors.

LARGE SPILLS: Evacuate area. Contain liquid; transfer to closed metal containers. Keep out of water supply.

DISPOSAL METHOD: (In order of preference) Send solvent to licensed reclaimer, incineration, evaporation of very small quantities, or approved landfill burial in compliance with local, state, and federal regulations. Dumping into sewers, on the ground, or into any body of water is strongly discouraged, and may be illegal.

SECTION 5

HEALTH HAZARD DATA

EYE: Pain and irritation, but no (or only minor) corneal injury likely.

SKIN CONTACT: Short contact - no irritation. Prolonged or repeated contact - moderate irritation and burning may occur. If confined to skin - pain and a burn.

SKIN ABSORPTION: Very low toxicity; not a hazard.

INGESTION: Low acute oral toxicity in rats, LD50 4 G/KG. But may be moderately toxic in humans.

INHALATION: ACGIH TLV is 50 PPM and OSHA guide is 100 PPM.

SYSTEMIC & OTHER EFFECT: Anesthesia. Prolonged or repeated exposures to levels over 100 PPM - possible organic injury. Can cause death if too much is breathed. Studies with toxic doses given by stomach tube indicated a carcinogenic response in one strain of laboratory mice, but not in other laboratory animals exposed by ingestion or inhalation. The preponderance of information indicates trichloroethylene is not likely to be a carcinogen in man.

SECTION 6

FIRST AID

EYES: Irrigate with flowing water immediately and continuously for fifteen minutes. Refer to medical personnel.

SKIN: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing. Call a physician. Wash clothing before reuse.

INGESTION: Do not induce vomiting. Call a physician or transport to emergency facility.

INHALATION: Remove to fresh air if effects occur. If respiration stops, give mouth-to-mouth resuscitation. Call physician and/or transport to medical facility.

NOTE TO PHYSICIAN:

EYES: May cause moderate irritation. Stain for evidence of corneal injury. If cornea is burned, instill antibiotic steroid preparation frequently. Consult ophthalmologist.

SKIN: May cause mild irritation. Chronic exposure may cause defatting type of dermatitis. Treat as any contact dermatitis.

RESPIRATORY: May cause drunkenness. Anesthetic or narcotic effect may occur. Administer oxygen if available. Bronchodilators, expectorants, and antitussives may be of help. Mechanical support of respiration may be needed.

ORAL: May cause chemical pneumonia if aspirated into lungs. If lavage is performed, suggest endotracheal and/or esophagoscopy control. Low in toxicity.

SYSTEMIC: May increase myocardial irritability. Avoid epinephrine or similar acting drugs if at all possible. Liver and kidney injury possible with overexposure. May cause nausea or vomiting. Alcohol consumed before and after exposure may increase injury. No specific antidote. Consult standard literature. Supportive care.

SECTION 6

SPECIAL HANDLING INFORMATION

VENTILATION: Recommend control of vapors to suggested guide.

RESPIRATORY PROTECTION: Approved respiratory protection required in absence of proper environmental control. For emergencies, a self-contained breathing apparatus or a full-face respirator is recommended.

PROTECTIVE CLOTHING: None required.

EYE PROTECTION: Safety glasses without side shields.

SECTION 7 SPECIAL PRECAUTIONS AND ADDITIONAL INFORMATION

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE: Handle with reasonable care. Avoid breathing vapors. Store in cool place. Vapors of this product are heavier than air and will collect in low areas such as pits, degreasers, storage tanks, and other confined areas. Do not enter these areas where vapors of this product are suspected unless special breathing apparatus is used and an observer is present for assistance.

APPROVALS:
ENVIRONMENTAL: _____
SALES: _____
RESEARCH: _____

U.S. DEPARTMENT OF LABOR
WORKPLACE STANDARDS ADMINISTRATION
BUREAU OF LABOR STANDARDS
MATERIAL SAFETY DATA SHEET

CONFIDENTIAL

Troy Chemical Industries, Inc.

(Essentially similar to O.S.H.A. Form 20)

SECTION I

TROY CHEMICAL INDUSTRIES, INC. - BOX 430 - 17040 RAPIDS ROAD - BURTON, OH 44021
EMERGENCY TELEPHONE NOS: (216) 834-4408, 834-4309, 548-5777

REVISION DATE: 07-16-85 PRODUCT NAME: TROY 1403 SUDSING SKIN CLEANER

CHEMICAL NAME & SYNONYMS: N/A

CHEMICAL FAMILY: A CLEANING COMPOUND

FORMULA: A PROPRIETARY PRODUCT

SECTION II - HAZARDOUS INGREDIENTS

HAZARDOUS MIXTURES OF OTHER LIQUIDS, SOLIDS, OR GASES

NONE	%	TLV (Units)
------	---	----------------

SECTION III - PHYSICAL DATA

Boiling Point (Deg. F.): N/A

Specific Gravity (H₂O=1): 1.01

Vapor Pressure (mm Hg.): N/A

Percent volatile by volume (%): N/A

Vapor Density (Air = 1): N/A

Evaporation Rate (Ethyl Ether = 1): N/A
Slower than ether

Solubility in Water: COMPLETE

Appearance & Odor: WHITE PASTE - FLORAL ODOR

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

Flash Point (Method Used): N/A

Flammable Limits: Lel Uel

Extinguishing Media: N/A

Special Fire Fighting Procedures: N/A

Unusual Fire and Explosion Hazards: N/A

SECTION V - HEALTH HAZARD DATA

Threshold Limit Value: NONE ESTABLISHED

Effects of Overexposure: NONE

Emergency and First Aid Procedures:

CONTAINS SODIUM LAURYL SULFATE - SHAMPOO GRADE - WHICH MAY BE IRRITATING TO TO THE EYES. IN CASE OF EYE CONTACT, FLUSH IMMEDIATELY WITH WATER. IF IRRITATION PERSISTS, SEE A PHYSICIAN.

SECTION VI - REACTIVITY DATA

Stability: STABLE

Incompatibility: DO NOT MIX WITH OTHER PRODUCTS

Hazardous Decomposition Products: NONE KNOWN

Hazardous Polymerization: WILL NOT OCCUR

SECTION VII - SPILL OR LEAK PROCEDURES

Steps To Be Taken in Case Material Is Released or Spilled:

DISPOSE OF IN ACCORDANCE WITH FEDERAL SALE - LOCAL REGULATIONS

Waste Disposal Method:

FLUSH INTO SEWER SYSTEM

SECTION VIII - SPECIAL PROTECTION INFORMATION

Respiratory Protection (Specify Type): N/A

Ventilation:

Protective Gloves: N/A

Eye Protection: N/A

Other Protective Equipment: N/A

SECTION IX - SPECIAL PRECAUTIONS

Precautions to be Taken in Handling and Storing:

STORE AT ROOM TEMPERATURE. DO NOT EXPOSE TO EXCESSIVE HEAT

Other Precautions: N/A

THE INFORMATION HEREIN IS GIVEN IN GOOD FAITH, BUT NO WARRANTY, EXPRESSED OR IMPLIED, IS MADE.

b:1403.MSD 071685

U.S. DEPARTMENT OF LABOR Occupational Safety and Health Administration		Form Approved OMB No. 44 R1387
MATE	CERRO COPPER PRODUCTS COMPANY MSDS NUMBER - CCPC-00-0252 APPROVALS:	Product
Required use	Shipby	3-20-86

SECTION I	
MANUFACTURER'S NAME STERLING ABRASIVE PRODUCTS COMPANY	EMERGENCY TELEPHONE NO. (419) 447-9321
ADDRESS (Number, Street, City, State, and ZIP Code) 525 WALL STREET, TIFFIN, OHIO 44883	
CHEMICAL NAME AND SYNONYMS VITRIFIED BONDED ABRASIVE PRODUCT	TRADE NAME AND SYNONYMS A OR C ABRASIVE & V BOND
CHEMICAL FAMILY OXIDE OR CARBIDE & SILICATES	FORMULA AL ₂ O ₃ OR SiC & SILICATE GLASSES

SECTION II - HAZARDOUS INGREDIENTS					
CHEMICAL NAME	COMMON NAME	CAS #	OSHA PEL	ACGIH TLV	CARCINOGEN Y/N
Aluminum Oxide or Silicon Carbide	Alumina Carbide	1344-28-1 7440-67-21	15 Mg/M ³ 15 Mg/M ³	10 Mg/M ³ 10 Mg/M ³	N N
Plus one or more of the following:					
Titanium Dioxide	Titania	13463-67-7	15 Mg/M ³	10 Mg/M ³	N
Glass/Porcelain	N/A	N/A		10 Mg/M ³	N
Sulfur	N/A	7704-34-2		10 Mg/M ³	N
Paraffin	Wax	8002-74-2		2 Mg/M ³	N

SECTION III - PHYSICAL DATA			
BOILING POINT (°F.)	N/A	SPECIFIC GRAVITY (H ₂ O=1)	N/A
VAPOR PRESSURE (mm Hg.)	N/A	PERCENT VOLATILE BY VOLUME (%)	N/A
VAPOR DENSITY (AIR=1)	N/A	EVAPORATION RATE (_____/_____/_____)	N/A
SOLUBILITY IN WATER	Slight		
APPEARANCE AND ODOR Solid - May give off slight odor if treated			

SECTION IV - FIRE AND EXPLOSION HAZARD DATA							
FLASH POINT (Method used)	N/A	FLAMMABLE LIMITS	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%;">Lel</td> <td style="width: 50%;">Uel</td> </tr> <tr> <td>N/A</td> <td>N/A</td> </tr> </table>	Lel	Uel	N/A	N/A
Lel	Uel						
N/A	N/A						
EXTINGUISHING MEDIA	Water or CO ₂						
SPECIAL FIRE FIGHTING PROCEDURES	None						
UNUSUAL FIRE AND EXPLOSION HAZARDS	None						

SECTION V - HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE

10 Mg/M³ AL₂O₃ or SiC

EFFECTS OF OVEREXPOSURE

Inhalation - coughing, shortness of breath; skin - irritation; eyes - irritation; ingestion - no none effects but not recommended

EMERGENCY AND FIRST AID PROCEDURES

Inhalation - remove to fresh air. Obtain medical assistance if needed
Skin - wash with soap & water; Eyes - flush with large amounts of clean water - obtain medical assistance.

SECTION VI - REACTIVITY DATA

STABILITY

UNSTABLE

STABLE

CONDITIONS TO AVOID

Avoid strong acids, bases, extreme heat or cold
or sudden temperature change

INCOMPATIBILITY (Materials to avoid)

None

HAZARDOUS DECOMPOSITION PRODUCTS

Dust arising from use should be controlled within TLV's

HAZARDOUS
POLYMERIZATION

MAY OCCUR

WILL NOT OCCUR

CONDITIONS TO AVOID

N/A

N/A

SECTION VII - SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

Normal clean-up

No special steps needed

WASTE DISPOSAL METHOD

Standard landfill methods consistent with federal, state and local laws

SECTION VIII - SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION (Specify type) See OSHA 29 CFR 1910.134

MSHA or NIOSH approved respirator may be required if TLV's exceeded

VENTILATION

LOCAL EXHAUST See OSHA 29 CFR 1910.94

Recommended - see ANSI Z43.1

MECHANICAL (General) See OSHA 29 CFR 1910.94

Recommended - see ANSI Z43.1

SPECIAL

Dependant on workpiece

OTHER

N/A

PROTECTIVE GLOVES

As desired by operator

EYE PROTECTION

Required - see OSHA 29 CFR 1910.133

OTHER PROTECTIVE EQUIPMENT

Apron and face shield as desired - hearing protection - see OSHA 29 CFR 1910.95

SECTION IX - SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING

Avoid mechanical damage; handle and store in accordance with ANSI B7.1 - allow wheels to warm to room temperature before using.

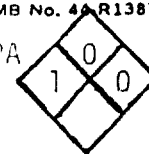
OTHER PRECAUTIONS Always use wheels in accordance with ANSI B7.1, ANSI Z43.1 and OSHA 29 CFR 1910.215. Never use wheels suspected of being dropped, cracked or damaged. Always use a safety guard. Never exceed the maximum operating speed marked on the wheel.

APPROVALS:

ENVIRONMENTAL: (PRIOR)
 SAFETY: (PRIOR)
 PURCHASING: (PRIOR)

 Form Approved
 OMB No. 4010-1087

NFPA



MATERIAL SAFETY DATA SHEET

Required under USDL Safety and Health Regulations for Ship Repairing,
 Shipbuilding, and Shipbreaking (29 CFR 1915, 1916, 1917)

SECTION I

Amended November, 1985

MANUFACTURER'S NAME

Panther Chemical Co., Inc.

EMERGENCY TELEPHONE NO.

(817) 834-7164

ADDRESS (Number, Street, City, State, and ZIP Code)

600 N. Beach St., P.O. Box 961001, Fort Worth, Texas 76161

CHEMICAL NAME AND SYNONYMS

N/A

TRADE NAME AND SYNONYMS

WED-129

CHEMICAL FAMILY

General Purpose Liquid Cleaner

FORMULA

N/A

SECTION II - HAZARDOUS INGREDIENTS

PAINTS, PRESERVATIVES, & SOLVENTS	%	TLV (Units)	ALLOYS AND METALLIC COATINGS	%	TLV (Units)
PIGMENTS			BASE METAL		
CATALYST			ALLOYS		
VEHICLE			METALLIC COATINGS		
SOLVENTS			FILLER METAL PLUS COATING OR CORE FLUX		
ADDITIVES			OTHERS		
OTHERS					
HAZARDOUS MIXTURES OF OTHER LIQUIDS, SOLIDS, OR GASES				%	TLV (Units)
2 - Butoxyethanol (111-76-2)		(TWA - 120 mg/m ³)		5	50ppm (skin)*
		(ACGIH-TLV-25 ppm skin)			
*Source OSHA 29 CFR 1910.1000, Table Z-1					

SECTION III - PHYSICAL DATA

BOILING POINT (°F.)	212°F.	SPECIFIC GRAVITY (H ₂ O=1)	1.07
VAPOR PRESSURE (mm Hg.)	as water	PERCENT VOLATILE BY VOLUME (%)	88.2
VAPOR DENSITY (AIR=1)	as water	EVAPORATION RATE (_____ = 1)	as water
SOLUBILITY IN WATER	infinite	pH (50% sol.)	12.4
APPEARANCE AND ODOR	Clear Fluorescent pink liquid with detergent odor		

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (Method used)	None	FLAMMABLE LIMITS	Let	Uel
EXTINGUISHING MEDIA	Not applicable			
SPECIAL FIRE FIGHTING PROCEDURES	None			
UNUSUAL FIRE AND EXPLOSION HAZARDS	None			

SECTION V - HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE

Not established - See Section II

EFFECTS OF OVEREXPOSURE

Prolonged skin contact may cause moderate skin irritation.

Irritating to eyes. Carcinogens - None known.

EMERGENCY AND FIRST AID PROCEDURES

Flush affected skin or eyes with water for 15 minutes. Eye contact: Seek immediate medical attention. If swallowed: Give one or two glasses of milk or water. Call a physician immediately.

SECTION VI - REACTIVITY DATA

STABILITY

UNSTABLE

CONDITIONS TO AVOID

N/A

STABLE

X

INCOMPATIBILITY (Materials to avoid)

Acids

HAZARDOUS DECOMPOSITION PRODUCTS

HAZARDOUS POLYMERIZATION

MAY OCCUR

CONDITIONS TO AVOID

WILL NOT OCCUR

X

N/A

SECTION VII - SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

Wear suitable protective equipment. Spills can be flushed with water.

WASTE DISPOSAL METHOD

Normal for cleaning compounds in your area. Consult Federal, State or local disposal authorities for approved procedures. Incinerate in a furnace where permitted under appropriate Federal, State and local regulations.

SECTION VIII - SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION (Specify type)

None required when used with adequate ventilation.

VENTILATION

LOCAL EXHAUST

Sufficient to maintain below component's TLV

SPECIAL

None

MECHANICAL (General)

None

OTHER

None

PROTECTIVE GLOVES

Rubber

EYE PROTECTION

Goggles or splash proof safety glasses

OTHER PROTECTIVE EQUIPMENT

None

SECTION IX - SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING

Avoid breathing vapor or mist. Avoid contact with eyes, skin and clothing. Keep container closed. Use with adequate ventilation. Wash thoroughly after handling.

OTHER PRECAUTIONS

Store between 30° - 120°F. Avoid freezing conditions.

Witco

WITCO MATERIAL SAFETY DATA S

MSDS NUMBER - CCPC-00-0055

APPROVALS:

ENVIRONMENTAL: _____

SAFETY: _____

REVISION: _____

NFPA HAZARD RATING (0=insignificant;
1=slight;2=moderate;3=high;4=extreme):

Fire: 0 Reactivity:0
Toxicity: 1 Special:

PRODUCT: Witconate 90 Flake

SECTION I - WITCO MANUFACTURING DIVISION

[1] Organics Division	Emergency Telephone:(713)433-7281
[2] 3200 Brookfield Houston,TX 77045	CHEM TREC: 1-800-424-9300
[3] CHEMICAL NAME OR FAMILY:	[4] FORMULA:
Linear Dodecylbenzenesulfonate, Sodium Salt	NA

SECTION II - CHEMICAL AND PHYSICAL PROPERTIES

[5] HAZARDOUS DECOMPOSITION PRODUCTS: NA	[6] INCOMPATIBILITY: NA
[7] TOXIC & HAZARDOUS INGREDIENTS:	
None	

[8] FORM: Solid	[9] ODOR: Bland
[10] APPEARANCE: Light flakes	[11] COLOR: Cream
[12] SPECIFIC GRAVITY (water=1):0.50	[13] BOILING PT.: NA
[14] MELTING POINT: NA	[15] SOLUBILITY IN WATER at 25°C:Soluble
[16] % VOLATILE BY % Wt.: NA	[17] EVAP. RATE (n-BuAc=1): NA
[18] VAPOR PRESSURE (mm Hg at 20°C): 1	[19] VAPOR DENSITY (air=1): NA
[20] pH AS IS:	[21] STRONG ACID:
pH (): 6-8	STRONG BASE:
[22] VISCOSITY SUS at 100°F:	STABLE: Yes
Less than 100:	[23] CAS #: 25155-30-0
Greater than 100: Yes	

SECTION III - FIRE AND EXPLOSION DATA

[24] For fires involving this material, do not enter without proper protective equipment including self-contained breathing apparatus.	
[25] UNUSUAL FIRE AND EXPLOSION HAZARDS:	[26] FLASH POINT (Method used):
None	PMCC: 200° F
[27] FLAMMABLE LIMITS %: NA	
[28] EXTINGUISHING AGENTS:	
Drychemical: Yes	CO ₂ : Yes
Waterspray: Yes	Foam: Yes
Waterfog: Yes	Sand/earth: Yes
Other:	

SECTION IV - HEALTH HAZARD DATA

[29] PERMISSIBLE CONCENTRATIONS (Air):	[30] EFFECTS OF OVEREXPOSURE:
NA	NDA
[31] TOXICOLOGICAL PROPERTIES:	
NDA	

NA = NOT APPLICABLE

NDA = NO DATA AVAILABLE

+ = GREATER THAN

- = LESS THAN

EMERGENCY FIRST AID PROCEDURES:

- [32] Eyes: Flush immediately with plenty of water for fifteen minutes and call a physician.
- [33] Skin Contact: Flush with plenty of water for fifteen minutes.
- [34] Inhalation: If difficulty in breathing, remove victim to non-contaminated air. If laboring with breathing, give fresh air or oxygen.
- [35] If swallowed: Call a physician.

SECTION V - SPECIAL PROTECTION INFORMATION

- [36] VENTILATION TYPE REQUIRED: Mechanical [37] RESPIRATORY PROTECTION: None
- [38] PROTECTIVE GLOVES: Plastic coated or rubber [39] EYE PROTECTION: Safety goggles or splash shield
- [40] OTHER PROTECTIVE EQUIPMENT: Protective apron

SECTION VI - HANDLING OF SPILLS OR LEAKS

- [41] PROCEDURES FOR CLEAN-UP:

Sweep up and dispose of in accordance with federal, state, and local regulations.

- [42] WASTE DISPOSAL:
By methods consistent with federal, state, and local regulations.

SECTION VII - SPECIAL PRECAUTIONS

- [43] PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE:
Store between 40° and 120°F in a dry place

SECTION VIII - TRANSPORTATION DATA

- [44] UNREGULATED BY D.O.T.: [45] REGULATED BY D.O.T.: Yes
- [46] TRANSPORTATION EMERGENCY INFORMATION: CHEM TREC 1-(800)-424-9300
- [47] U.S.D.O.T. PROPER SHIPPING NAME: Sodium dodecylbenzenesulfonate
- [48] U.S.D.O.T. HAZARD CLASS: ORM-E
- [49] I.D. NUMBER: NA 9146 [50] RQ: 1000 [51] LABEL(S) REQUIRED: None
- [52] FREIGHT CLASSIFICATION: Cleaning Compound
- [53] SPECIAL TRANSPORTATION NOTES: None

SECTION IX - NFPA (HMIS) RATINGS

- | | | | |
|---------------|---|----------------------|---|
| [54] HEALTH: | 1 | REACTIVITY: | 0 |
| FLAMMABILITY: | 0 | PERSONAL PROTECTION: | C |

Signature Charles P. Green Title: Group Manager - Analytical
Revision Date: 12/85

We believe the statements, technical information and recommendations contained herein are reliable, but they are given without warranty or guarantee of any kind, express or implied, and we assume no responsibility for any loss, damage, or expense, direct or consequential, arising out of their use.



ENVIRONMENTAL
SAFETY
Hazardous Waste

WITCO MATERIAL SAFETY DATA SHEET

NFPA HAZARD RATING (0=insignificant;
1=slight;2=moderate;3=high;4=extreme):

PRODUCT: Witconate 85 Powder

Fire: 0 Reactivity: 0
Toxicity: 1 Special:

SECTION I - WITCO MANUFACTURING DIVISION

[1] Organics Division	Emergency Telephone: (713) 433-7281
[2] 3200 Brookfield Houston, TX 77045	CHEM TREC: 1-800-424-9300
[3] CHEMICAL NAME OR FAMILY: Linear Dodecylbenzenesulfonate, Sodium Salt	[4] FORMULA: NA

SECTION II - CHEMICAL AND PHYSICAL PROPERTIES

[5] HAZARDOUS DECOMPOSITION PRODUCTS: NA	[6] INCOMPATIBILITY: NA
[7] TOXIC & HAZARDOUS INGREDIENTS: Sodium Dodecylbenzenesulfonate	CAS #: 25155-30-0
[8] FORM: Solid	[9] ODOR: Bland
[10] APPEARANCE: Light powder	[11] COLOR: Cream
[12] SPECIFIC GRAVITY (water=1): 0.50	[13] BOILING PT.: NA
[14] MELTING POINT: NA	[15] SOLUBILITY IN WATER at 25°C: Soluble
[16] % VOLATILE BY % Wt.: NA	[17] EVAP. RATE (n-BuAc=1): NA
[18] VAPOR PRESSURE (mm Hg at 20°C): 1	[19] VAPOR DENSITY (air=1): NA
[20] pH AS IS: pH (): 6-8	[21] STRONG ACID: STRONG BASE: STABLE: Yes
[22] VISCOSITY SUS at 100°F: Less than 100: Greater than 100: Yes	[23] CAS #:

SECTION III - FIRE AND EXPLOSION DATA

[24] For fires involving this material, do not enter without proper protective equipment including self-contained breathing apparatus.	[26] FLASH POINT (Method used): PMCC: 200° F
[25] UNUSUAL FIRE AND EXPLOSION HAZARDS: None	
[27] FLAMMABLE LIMITS %: NA	
[28] EXTINGUISHING AGENTS: Drychemical: Yes Waterspray: Yes Waterfog: Yes Other:	CO ₂ : Yes Foam: Yes Sand/earth: Yes

SECTION IV - HEALTH HAZARD DATA

[29] PERMISSIBLE CONCENTRATIONS (Air): NA	[30] EFFECTS OF OVEREXPOSURE: NDA
[31] TOXICOLOGICAL PROPERTIES: NDA	

EMERGENCY FIRST AID PROCEDURES:

- [32] Eyes: Flush immediately with plenty of water for fifteen minutes and call a physician.
- [33] Skin Contact: Flush with plenty of water for fifteen minutes.
- [34] Inhalation: If difficulty in breathing, remove victim to non-contaminated air. If laboring with breathing, give fresh air or oxygen.
- [35] If swallowed: Call a physician.

SECTION V - SPECIAL PROTECTION INFORMATION

- [36] VENTILATION TYPE REQUIRED: Mechanical
- [37] RESPIRATORY PROTECTION: Use NIOSH-approved mask to protect against dust - Dustfo-66 type.
- [38] PROTECTIVE GLOVES: Plastic coated or rubber
- [39] EYE PROTECTION: Safety goggles or splash shield
- [40] OTHER PROTECTIVE EQUIPMENT: Protective apron

SECTION VI - HANDLING OF SPILLS OR LEAKS

- [41] PROCEDURES FOR CLEAN-UP: Sweep up and dispose of in accordance with federal, state, and local regulations.
- [42] WASTE DISPOSAL: By methods consistent with federal, state, and local regulations.

SECTION VII - SPECIAL PRECAUTIONS

- [43] PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE: Store between 40° and 120°F in a dry place

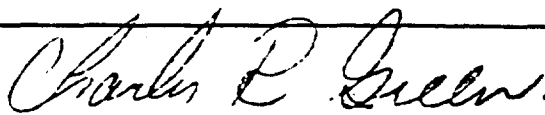
SECTION VIII - TRANSPORTATION DATA

- [44] UNREGULATED BY D.O.T.: [45] REGULATED BY D.O.T.: Yes
- [46] TRANSPORTATION EMERGENCY INFORMATION: CHEM TREC 1-(800)-424-9300
- [47] U.S.D.O.T. PROPER SHIPPING NAME: Sodium dodecylbenzenesulfonate
- [48] U.S.D.O.T. HAZARD CLASS: ORM-E
- [49] I.D. NUMBER: NA 9146 [50] RQ: 1000 [51] LABEL(S) REQUIRED: None
- [52] FREIGHT CLASSIFICATION: Cleaning Compound
- [53] SPECIAL TRANSPORTATION NOTES: None

SECTION IX - COMMENTS

[54]

Signature



Title: Group Manager - Analytical

Revision Date: 12/85

We believe the statements, technical information and recommendations contained herein are reliable, but they are given without warranty or guarantee of any kind, express or implied, and we assume no responsibility for any loss, damage, or expense, direct or consequential, arising out of their use.

Witco

CLARK COPPER PRODUCTS COMPANY
MSDS NUMBER - CCPC-00-0257
APPROVAL:
ENVIRONMENTAL: _____
SAFETY: _____
REGULATORY: _____

WITCO MATERIAL SAFETY DATA :

PRODUCT: Witconate 85 Flake

NFPA HAZARD RATING (0=insignificant;
1=slight;2=moderate;3=high;4=extreme):

Fire: 0 Reactivity:0
Toxicity: 1 Special:

SECTION I - WITCO MANUFACTURING DIVISION

[1] Organics Division	Emergency Telephone:(713)433-7281
[2] 3200 Brookfield Houston,TX 77045	CHEM TREC: 1-800-424-9300
[3] CHEMICAL NAME OR FAMILY: Linear Dodecylbenzenesulfonate, Sodium Salt	[4] FORMULA: NA

SECTION II - CHEMICAL AND PHYSICAL PROPERTIES

[5] HAZARDOUS DECOMPOSITION PRODUCTS: NA	[6] INCOMPATIBILITY: NA
[7] TOXIC & HAZARDOUS INGREDIENTS: Sodium Dodecylbenzenesulfonate	CAS #: 25155-30-0
[8] FORM: Solid	[9] ODOR: Bland
[10] APPEARANCE: Light flakes	[11] COLOR: Cream
[12] SPECIFIC GRAVITY (water=1):0.40	[13] BOILING PT.: NA
[14] MELTING POINT: NA	[15] SOLUBILITY IN WATER at 25°C:Soluble
[16] % VOLATILE BY % Wt.: na	[17] EVAP. RATE (n-BuAc=1): na
[18] VAPOR PRESSURE (mm Hg at 20°C): 1	[19] VAPOR DENSITY (air=1): NA
20] pH AS IS: pH (): 6-8	[21] STRONG ACID: STRONG BASE: STABLE: Yes
[22] VISCOSITY SUS at 100°F: Less than 100: Greater than 100: Yes	[23] CAS #:

SECTION III - FIRE AND EXPLOSION DATA

[24] For fires involving this material, do not enter without proper protective equipment including self-contained breathing apparatus.	[26] FLASH POINT (Method used): PMCC: 200° F
[25] UNUSUAL FIRE AND EXPLOSION HAZARDS: None	
[27] FLAMMABLE LIMITS %: NA	
[28] EXTINGUISHING AGENTS: Drychemical: Yes Waterspray: Yes Waterfog: Yes Other:	CO ₂ : Yes Foam: Yes Sand/earth: Yes

SECTION IV - HEALTH HAZARD DATA

[29] PERMISSIBLE CONCENTRATIONS (Air): NA	[30] EFFECTS OF OVEREXPOSURE: NDA
[31] TOXICOLOGICAL PROPERTIES:	

EMERGENCY FIRST AID PROCEDURES:

- [32] Eyes: Flush immediately with plenty of water for fifteen minutes and call a physician.
- [33] Skin Contact: Flush with plenty of water for fifteen minutes.
- [34] Inhalation: If difficulty in breathing, remove victim to non-contaminated air. If laboring with breathing, give fresh air or oxygen.
- [35] If swallowed: Call a physician.

SECTION V - SPECIAL PROTECTION INFORMATION

- [36] VENTILATION TYPE REQUIRED: Mechanical
- [37] RESPIRATORY PROTECTION:
Use NIOSH-approved mask to protect against dust - Dustfo-66 type.
- [38] PROTECTIVE GLOVES:
Plastic coated or rubber
- [39] EYE PROTECTION:
Safety goggles or splash shield
- [40] OTHER PROTECTIVE EQUIPMENT:
Protective apron

SECTION VI - HANDLING OF SPILLS OR LEAKS

- [41] PROCEDURES FOR CLEAN-UP:

Sweep up and dispose of in accordance with federal, state, and local regulations.

- [42] WASTE DISPOSAL:
By methods consistent with federal, state, and local regulations.

SECTION VII - SPECIAL PRECAUTIONS

- [43] PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE:
Store between 40° and 120°F in a dry place

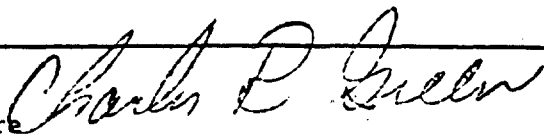
SECTION VIII - TRANSPORTATION DATA

- [44] UNREGULATED BY D.O.T.: [45] REGULATED BY D.O.T.: Yes
- [46] TRANSPORTATION EMERGENCY INFORMATION: CHEM TREC 1-(800)-424-9300
- [47] U.S.D.O.T. PROPER SHIPPING NAME: Sodium dodecylbenzenesulf
- [48] U.S.D.O.T. HAZARD CLASS: ORM-E
- [49] I.D. NUMBER: NA 9146 [50] RQ: 1000 [51] LABEL(S) REQUIRED: None
- [52] FREIGHT CLASSIFICATION: Cleaning Compound
- [53] SPECIAL TRANSPORTATION NOTES: None

SECTION IX - COMMENTS

- [54]

Signature



Title: Group Manager - Analytical

Revision Date: 12/85

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APPROVALS

ENVIRONMENTAL _____ (PRIOR) _____
SAFETY _____ (PRIOR) _____
PURCHASING _____ (PRIOR) _____

PAGE 1

PETROLITE CORPORATION
369 MARSHALL AVE.
ST. LOUIS MO 63119 U.S.AREVISION DATE: 10/26/87
EMERGENCY PHONE: 1-314-961-3500
CHEMTREC EMER NO: 1-800-424-9300

SECTION 1 PRODUCT IDENTIFICATION

PRODUCT: XC 0215

TRADE NAME: X-CIDE

LABEL: 000
097

SHIPPING NAME: NOT HAZARDOUS PER D.O.T. CFR TITLE 49

CHEMICAL DESCRIPTION

5-CHLORO-2-METHYL-4-ISOTHIAZOLIN-3-ONE, 2-METHYL-4-ISOTHIAZOLIN-3-ONE IN WATER.

SECTION 2 HAZARDOUS INGREDIENTS

CAS NUMBER	MATERIAL	%	EXPOSURE LIMITS
26172-55-4	5-chloro-2-methyl-4-isothioazoline-3-one	1.2	RECOM. 0.1 mg/M3
02682-20-4	2-methyl-4-isothiazolin-3-one	.35	Not Established

SECTION 3 PHYSICAL DATA

SPECIFIC GRAVITY(H2O = 1.0@60 F): 1.026
VAPOR PRESSURE: Not EstablishedVOLATILITY: N/A
SOL. IN WATER: Soluble

MISC. DATA: pH = 3 - 5

APPEARANCE AND ODOR: Pale yellow to green liquid. Mild aromatic odor.

SECTION 4 FIRE AND EXPLOSION HAZARD DATA

FLASH POINT: >200 F

FLAMMABLE LIMITS: Not Established

FLASH METHOD:

EXTINGUISHING MEDIA:

Use water spray or fog, alcohol-type foam, dry chemical or CO2.

FIRE FIGHTING PROCEDURES:

Use a self-contained breathing apparatus with full facepiece operated in pressure-demand or other positive pressure mode. Non-flammable. Keep fire-exposed containers cool using water spray.

CONTINUED ON PAGE: 2

MATERIAL SAFETY DATA SHEET

PAGE 2

***CONTINUATION OF XC 0215 ***

UNUSUAL FIRE AND EXPLOSION HAZARDS:

None known.

SECTION 5 HEALTH HAZARD DATA

EFFECTS OF OVEREXPOSURE:

INHALATION:

Inhalation of mists, aerosols or very high vapor concentrations will produce intense eye, nose and respiratory irritation and may result in lung damage. Prolonged exposure may result in chemical pneumonitis and, in extreme cases, pulmonary edema.

INHALATION LC50: >13.7 mg/L (Rat)

SKIN AND EYE CONTACT:

Contact with skin will cause moderate to severe irritation or burns. Contact with eyes will result in severe eye irritation or burns, and if not immediately removed, may lead to permanent eye injury. Repeated skin contact may produce allergic sensitization. In such cases, incidental (minor) contact may cause allergic rashes.

EYE IRR. SCORE: 4 (0=None, 4=Severe)

SKIN IRR SCORE: 3 (0=None, 4=Severe)

DERMAL LD50: >5 g/kg (Rab.)

INGESTION:

Causes severe irritation or burns to the mouth and gastrointestinal tract. In extreme cases may cause kidney and liver damage.

ORAL LD50: 3.81 g/kg (Rat)

EMERGENCY AND FIRST AID PROCEDURES:

If contacted, wash skin immediately with soap and water. Remove contaminated clothing and wash before reuse. If irritation or burns develop, consult a physician. If in eyes, irrigate with flowing water immediately and continuously for fifteen minutes. Consult a physician. If inhaled, remove to fresh air. Administer oxygen if necessary. Consult a physician if symptoms persist or exposure was severe.

CONTINUED ON PAGE: 3

MATERIAL SAFETY DATA SHEET

PAGE 3

***CONTINUATION OF XC 0215 ***

If ingested, DO NOT induce vomiting. If conscious, drink promptly large quantities of water. Call a physician immediately. NOTE TO PHYSICIAN: Probable mucosal damage may contraindicate the use of gastric lavage. Measures against circulatory shock and convulsion may be necessary.

SECTION 6 REACTIVITY DATA

STABILITY:

Stable under normal conditions of storage and use.

INCOMPATIBILITY:

Keep away from strong oxidizing agents.

HAZARDOUS DECOMPOSITION PRODUCTS:

Oxides of sulfur and nitrogen. HCl.

HAZARDOUS POLYMERIZATION:

Will not occur.

SECTION 7 SPILL AND LEAK PROCEDURES

IF MATERIAL IS SPILLED OR RELEASED:

Dike and absorb spill using hypochlorite solution* in combination with inert material (dry sand, earth etc.) and transfer to suitable containers for disposal.

*Recommended formulation: 8 lbs. calcium hypochlorite (HTH 65% active ingredient), 5 lbs. sodium hydroxide 50% and 77 lbs. water. Sodium hydroxide must be added to maintain alkalinity and prevent the evolution of chlorine gas.

DISPOSAL METHOD:

Place chemical residues and contaminated adsorbent materials into a suitable waste container and take to an approved hazardous waste disposal site. Dispose of all residues in accordance with applicable waste management regulations.

DECONTAMINATION PROCEDURES:

Not appropriate.

SECTION 8 SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION:

When ventilation is not adequate, use of a NIOSH-approved dust, mist and fume respirator is recommended. In emergency situations, the use of a self-contained breathing unit may be necessary.

CONTINUED ON PAGE: 4

MATERIAL SAFETY DATA SHEET

PAGE 4

***CONTINUATION OF XC 0215 ***

VENTILATION:

General ventilation should be provided to maintain ambient concentrations below nuisance levels. Local ventilation of emission sources may be necessary.

PROTECTIVE CLOTHING:

Synthetic gloves (such as rubber, neoprene, nitrile or viton), chemical goggles, face shield and synthetic apron or coveralls should be used to prevent contact with eyes, skin or clothing.

SECTION 9 SPECIAL PRECAUTIONS

Avoid breathing of vapors and contact with eyes, skin or clothing. Hazardous product residue may remain in emptied container. Do not reuse container without commercial cleaning or reconditioning.

Although the information and recommendations set forth herein are believed to be correct as of the date hereof, Petrolite makes no representations to the accuracy of such information and recommendations. It is the user's responsibility to determine the suitability and completeness of such information and recommendation for its own particular use. Petrolite shall not be responsible for any direct, indirect, incidental or consequential damages of whatsoever nature resulting from the publication, use of or reliance upon such information and recommendations.

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ENVIRONMENTAL _____ (PRIOR)
SAFETY _____ (PRIOR)
PURCHASING _____ (PRIOR)PETROLITE CORPORATION
369 MARSHALL AVE.
ST. LOUIS MO 63119 U.S.AREVISION DATE: 07/06/89
EMERGENCY PHONE: 1-314-961-3500
CHEMTREC EMER NO: 1-800-424-9300

SECTION 1 PRODUCT IDENTIFICATION

PRODUCT: XC 0102

TRADE NAME: X-CIDE

LABEL:

SHIPPING NAME: NOT HAZARDOUS PER D.O.T. CFR TITLE 49

CHEMICAL DESCRIPTION

GLUTARALDEHYDE AND WATER.

SECTION 2 HAZARDOUS INGREDIENTS

CAS NUMBER	MATERIAL	%	EXPOSURE LIMITS
00111-30-8	Glutaraldehyde	25	ACGIH TLV: 0.2 ppm C

SECTION 3 PHYSICAL DATA

SPECIFIC GRAVITY (H2O = 1.0@60 F): 1.066

VOLATILITY: N/A

VAPOR PRESSURE: Not Established

SOL. IN WATER: Soluble

APPEARANCE AND ODOR: Light amber liquid. Characteristic odor.

SECTION 4 FIRE AND EXPLOSION HAZARD DATA

FLASH POINT: >200 F

FLAMMABLE LIMITS: Not Established

FLASH METHOD:

SFCC ASTM D-3828

EXTINGUISHING MEDIA:

Material is non-flammable. Use water spray, foam, CO2 or any other media suitable for extinguishing materials supporting combustion.

FIRE FIGHTING PROCEDURES:

Use a self-contained breathing apparatus with full facepiece operated in pressure-demand or other positive pressure mode. Non-flammable. Keep fire-exposed containers cool using water spray.

UNUSUAL FIRE AND EXPLOSION HAZARDS:

None known.

CONTINUED ON PAGE: 2

MATERIAL SAFETY DATA SHEET

PAGE 2

***CONTINUATION OF XC 0102 ***

SECTION 5 HEALTH HAZARD DATA

EFFECTS OF OVEREXPOSURE:

INHALATION:

Vapors are moderately to highly irritating to eyes, nose and respiratory system. Prolonged exposure to excessive concentrations may result in delayed lung injury as well as kidney and liver damage.

SKIN AND EYE CONTACT:

Contact with skin will cause moderate to severe irritation or burns. Contact with eyes will result in severe eye irritation or burns, and if not immediately removed, may lead to permanent eye injury. Repeated skin contact may produce allergic sensitization. In such cases, incidental (minor) contact may cause allergic rashes.

INGESTION:

Causes severe irritation or burns to the mouth and gastrointestinal tract. In extreme cases may cause kidney and liver damage.

EMERGENCY AND FIRST AID PROCEDURES:

If contacted, wash skin immediately with soap and water. Remove contaminated clothing and wash before reuse. If irritation or burns develop, consult a physician. If in eyes, irrigate with flowing water immediately and continuously for fifteen minutes. Consult a physician. If inhaled, remove to fresh air. Administer oxygen if necessary. Consult a physician if symptoms persist or exposure was severe. If ingested, DO NOT induce vomiting. If conscious, drink promptly large quantities of water. Call a physician immediately. NOTE TO PHYSICIAN: Probable mucosal damage may contraindicate the use of gastric lavage. Measures against circulatory shock and convulsion may be necessary.

SECTION 6 REACTIVITY DATA

STABILITY:

Stable under normal conditions of storage and use.

INCOMPATIBILITY:

Avoid contamination with acids and alkalies.

HAZARDOUS DECOMPOSITION PRODUCTS:

None known.

CONTINUED ON PAGE: 3

MATERIAL SAFETY DATA SHEET

PAGE 3

***CONTINUATION OF XC 0102 ***

HAZARDOUS POLYMERIZATION:

Will not occur.

SECTION 7 SPILL AND LEAK PROCEDURES

IF MATERIAL IS SPILLED OR RELEASED:

Small spill - Absorb on paper, cloth or other material.

Large spill - Dike to prevent entering any sewer or water-way. Transfer liquid to a holding container. Cover residue with dirt, or suitable chemical adsorbent. Use personal protective equipment as necessary.

DISPOSAL METHOD:

This product is a registered industrial antimicrobial product. Please refer to product label for disposal instructions.

DECONTAMINATION PROCEDURES:

Not appropriate.

SECTION 8 SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION:

When concentrations exceed the exposure limits specified, use of a NIOSH-approved supplied air respirator is recommended. Where the protection factor of the respirator may be exceeded, use of a self-contained breathing unit may be necessary.

VENTILATION:

General ventilation should be provided to maintain ambient concentrations below nuisance levels. Local ventilation of emission sources may be necessary to maintain ambient concentrations below recommended exposure limits.

PROTECTIVE CLOTHING:

Chemical-resistant gloves and chemical goggles, face shield and synthetic apron or coveralls should be used to prevent contact with eyes, skin or clothing.

SECTION 9 SPECIAL PRECAUTIONS

Avoid breathing of vapors and contact with eyes, skin or clothing. Hazardous product residue may remain in emptied container. Do not reuse container without commercial cleaning or reconditioning.

CONTINUED ON PAGE: 4

MATERIAL SAFETY DATA SHEET

PAGE 4

***CONTINUATION OF XC 0102 ***

This product is a registered industrial antimicrobial product. Please refer to the product label for drum cleaning instructions.

Although the information and recommendations set forth herein are believed to be correct as of the date hereof, Petrolite makes no representations to the accuracy of such information and recommendations. It is the user's responsibility to determine the suitability and completeness of such information and recommendation for its own particular use. Petrolite shall not be responsible for any direct, indirect, incidental or consequential damages of whatsoever nature resulting from the publication, use of or reliance upon such information and recommendations.

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ENVIRONMENTAL DATA SHEET

PAGE 1

PETROLITE CORPORATION
369 MARSHALL AVE.
ST. LOUIS MO 63119 U.S.A.

REVISION DATE: 05/17/90
EMERGENCY PHONE: 1-314-961-3500
CHEMTREC EMER NO: 1-800-424-9300

XC 0102

SARA TITLE III, SECTION 313

This notification is incorporated into the Material Safety Data Sheet (MSDS) for the Petrolite product named above. When physically attached to the MSDS, this notification must not be detached from the MSDS. Any copying and redistribution of the MSDS to which this notification is attached must include copying and redistribution of this notification.

This Petrolite product contains no toxic chemicals subject to the reporting requirements of section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR 372 in excess of the applicable de minimis concentration.



MATERIAL SAFETY DATA SHEET

Approved by U.S. Department of Labor "Essentially Similar" to Form LSB-OOS-4
Conforming to the requirements of the Occupational Safety and Health Act



CORPO. COPPER PRODUCTS COMPANY
MSDS NUMBER - CCPC-00-0260
APPROX. 1983

ENVIRONMENTAL: _____
HAZARD: _____
TOXICITY: _____

AL NAME:

NONYMS: --

CHEMICAL FAMILY:

RMULA: -- proprietary

MOLECULAR WEIGHT:

ADE NAME AND SYNONYMS:

XL-99 *

II. PHYSICAL DATA

Boiling Point, 760 mm. Hg	74°C 165°F	Freezing Point	-38°C -36°F
Specific Gravity (H ₂ O = 1)	1.318 @ 25/25°C	Vapor Pressure at 20°C.	100 mm Hg
Relative Density (air = 1)	4.55	Solubility in Water, % by wt.	Insoluble
Percent Volatiles Volume	100%	Evaporation Rate (Butyl Acetate = 1)	6
Appearance and Odor	Colorless liquid----ether odor		

III. HAZARDOUS INGREDIENTS

MATERIAL	%	TLV (Units)
Inhibited Chlorinated Hydrocarbons *	95	350
Non-hazardous ingredients	5	
*This formulation is same as Malter's XL-99 Aerosol except for the propellant.		

IV. FIRE AND EXPLOSION HAZARD DATA

Flash Point (method)	None C.O.C.	Autoignition Temperature	None
Flammable Limits in Air, % by volume	Lower	8.0	Upper 10.5
Extinguishing Media	Non-Flammable		
Special Fire Fighting Procedures	None		
Fire and Explosion Hazards	None		

EMERGENCY PHONE NUMBER

Area Code 504/ 362 3232 - Ext. 52

THRESHOLD LIMIT VALUE

350 ppm

EFFECTS OF OVEREXPOSURE

Inhalation-weak anesthetic action; Dermal-slight irritation or dermatitis
Ingestion-substantial amounts may cause illness.

EMERGENCY AND FIRST AID PROCEDURES

Inhalation-fresh air. If breathing stops, give artificial respiration. Get medical attention. Skin and eyes-Flush eyes with plenty of water. If irritation or injury develops or persists, get medical attention. Ingestion-treat symptomatically. Do not give adrenalin. Do not induce vomiting. Call physician.

V. REACTIVITY DATA

STABILITY

UNSTABLE

STABLE

CONDITIONS TO AVOID

XXXXXXXXXX

COMPATIBILITY
(materials to avoid)

May soften or damage certain paints and plastics.
Slow hydrolysis produces corrosive acid.

HAZARDOUS COMPOSITION PRODUCTS

Exposure to high temperatures produces irritating and noxious gases.

HAZARDOUS POLYMERIZATION

May Occur

Will Not Occur

CONDITIONS TO AVOID

XXXXXXXXXX

VI. SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN
IF MATERIAL IS RELEASED OR SPILLED

Mop or soak up in absorbent material and bury or ventilate area and allow to evaporate.

WASTE DISPOSAL METHOD

Bury away from water supply or allow to evaporate. Drum may be reused or sent to hazardous waste disposal.

VII. SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION
(specify type)

Concentration above 2% use self contained breathing apparatus.

VENTILATION

LOCAL EXHAUST

SPECIAL

MECHANICAL
(general)

Provide ventilation to control
TLV

OTHER

PROTECTIVE GLOVES

To prevent prolonged skin contact

EYE PROTECTION

Safety glasses

OTHER PROTECTIVE EQUIPMENT

None

VIII. SPECIAL PRECAUTIONS

PRECAUTIONARY LABELING

Keep out of reach of children.

Harmful if swallowed.

OTHER HANDLING AND STORAGE CONDITIONS

Store in cool, dry place. Keep drum closed.

CONOCO
Material Safety Data Sheet

Page

MATERIAL IDENTIFICATION-----
TURBINE OIL

MSDS NUMBER : LUBC0410
Revision Date : 07-Mar-91
Date Printed : 07-Mar-91

CERRO COPPER PRODUCTS COMPANY
MSDS NUMBER - CCPC-00-0261

APPROVALS:

ENVIRONMENTAL: _____

SAFETY: _____

PURCHASING: _____

MANUFACTURER/DISTRIBUTOR

Conoco Inc.
P.O. Box 2197
Houston, TX 77252

PHONE NUMBERS

GENERAL INFORMATION : 1-(713)293-5550
TRANSPORT EMERGENCY : 1-(800)424-9300
MEDICAL EMERGENCY : 1-(800)441-3637

GRADE : 32, 46, 68, 100, 32S
CHEMICAL FAMILY : Petroleum Hydrocarbons

TRADE NAMES / SYNONYMS

7319, 7320, 7321, 7322, 7325
Petroleum Lubricating Oil, Turbine Oils

CAS NUMBER : Mixture; See Regulatory Information
DU PONT REGISTRY NUMBER: DP414-88-4
NFPA RATINGS : Health: 0 Flammability: 1 Reactivity: 0
NPCA-HMIS RATINGS : Health: 1 Flammability: 1 Reactivity: 0
Personal Protection rating to be supplied by
user depending on use conditions.

WHMIS CLASSIFICATION

This is not a WHMIS controlled product.

OSHA HAZARD DETERMINATION
-----Hazardous Ingredients

Components of this material are not known to be hazardous
as defined by OSHA's Hazard Communication Standard,
29 CFR 1910.1200.

Refer to the Regulatory Information Section of this MSDS
for other federal and state regulatory information.

PHYSICAL DATA

Boiling Point : 650 to 1060 deg F
Vapor Pressure : Nil
Vapor Density : >1 (Air = 1.0)
% Volatiles : Nil
Evaporation Rate : Nil
Water Solubility : Insoluble
Odor : Pungent sweet
Form : Liquid
Color : Light brown
Specific Gravity : 0.86-0.87 (Water = 1)

HAZARDOUS REACTIVITY

Instability : Stable.
Incompatibility : Incompatible with strong oxidizing agents. Avoid sparks and flame.
Decomposition : Normal combustion forms carbon dioxide; incomplete combustion may produce carbon monoxide.
Polymerization : Polymerization will not occur.

FIRE AND EXPLOSION DATA

Flash Point : 285-380 deg F
Method : PM
Autoignition : 650-680 deg F

FIRE AND EXPLOSION HAZARDS

Class IIIB Combustible Liquid (NFPA).

EXTINGUISHING MEDIA

Water Spray. Foam. Dry Chemical. CO2.

SPECIAL FIRE FIGHTING INSTRUCTIONS

Special Fire Fighting Procedures: Water or foam may cause frothing. Use water to keep fire-exposed containers cool. Water spray may be used to flush spills away from exposures.

Unusual Fire and Explosion Hazards: Products of combustion may contain carbon monoxide, carbon dioxide and other toxic materials. Do not enter enclosed or confined space without proper protective equipment including respiratory protection.

HEALTH HAZARD INFORMATION

Primary Route of Exposure/Entry: Skin.

Signs and Symptoms of Exposure/Medical Conditions Aggravated by Exposure:

Mouse skin painting studies have shown that highly solvent-refined petroleum lubricating oils, which are similar to ingredients in this product, have not caused skin tumors. The product, as with many petroleum products, may cause minor skin, eye, or lung irritation, especially if poor hygienic practices or inadequate engineering design allow prolonged or repeated exposure.

CARCINOGENICITY

None of the components in this material is listed by IARC, NTP, OSHA, or ACGIH as a carcinogen.

EXPOSURE LIMITS**TURBINE OIL**

TLV (ACGIH) : None Established
PEL (OSHA) : None Established

SAFETY PRECAUTIONS

Wash thoroughly after handling. Wash clothing after use.

FIRST AID

INHALATION

If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician.

SKIN CONTACT

The compound is not likely to be hazardous by skin contact, but cleansing the skin after use is advisable. If irritation develops, consult a physician.

EYE CONTACT

In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Call a physician.

INGESTION

If swallowed, do not induce vomiting. Immediately give two glasses of water. Never give anything by mouth to an unconscious person. Call a physician.

(FIRST AID - Continued)

NOTES TO PHYSICIAN

Activated charcoal slurry may be administered.
To prepare activated charcoal slurry, suspend 50 grams
activated charcoal in 400mL water and mix thoroughly.
Administer 5mL/kg, or 350mL for an average adult.

PROTECTION INFORMATION

GENERALLY APPLICABLE CONTROL MEASURES AND PRECAUTIONS

Ventilation: Normal shop ventilation.

PERSONAL PROTECTIVE EQUIPMENT

Respiratory Protection: None normally required except
under unusual circumstances such as described in the
Fire and Explosion Section.

Protective Gloves: Should be worn when the potential exists
for prolonged or repeated skin contact. NBR or Neoprene
recommended.

Eye/Face Protection: Safety glasses with side shields if
splashing is probable.

Other Protective Equipment. Coveralls if splashing is
probable. Launder contaminated clothing before reuse.

SPILL, LEAK AND DISPOSAL INFORMATION

SPILL, LEAK, OR RELEASE

NOTE: Review FIRE AND EXPLOSION HAZARDS and SAFETY PRECAUTIONS before
proceeding with clean up. Use appropriate PERSONAL PROTECTIVE
EQUIPMENT during clean up.

Dike spill. Prevent liquid from entering sewers, waterways or low
areas. Recover free liquid for reuse or reclamation. Soak up with
sawdust, sand, oil dry or other absorbent material.

WASTE DISPOSAL

Treatment, storage, transportation and disposal must be in accordance
with applicable Federal, State/Provincial, and Local regulations.
Recover nonusable free liquid and dispose of in an approved and
permitted incinerator. Do not flush to surface water or sanitary sewer
system.

SHIPPING INFORMATION
-----DOT

Proper Shipping Name : Not regulated.

IATA/IMO

Proper Shipping Name : Not restricted.

STORAGE CONDITIONS

Store in accordance with National Fire Protection Assn regulations.

TITLE III HAZARD CLASSIFICATIONS

Acute : No
Chronic : No
Fire : No
Reactivity : No
Pressure : No

REGULATORY INFORMATION

OSHA HAZARD DETERMINATION

The material is not hazardous as defined by OSHA's Hazard Communication Standard, 29 CFR 1910.1200.

EPA DETERMINATIONS

COMPREHENSIVE ENVIRONMENTAL RESPONSE, COMPENSATION, &
LIABILITY ACT (CERCLA/SUPERFUND), 40 CFR 302
Not applicable; this material is covered by the CERCLA
petroleum exclusion. Releases are not reportable.

SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT OF 1986,
TITLE III (SARA) - SECTIONS 302, 304, 313

SECTION 302/304 - Extremely Hazardous Substances (40 CFR
355)

The material is not known to contain extremely hazardous
substances at greater than 1.0% concentration; however,
it is possible that this material may contain extremely
hazardous substances at a lower concentration so that a
large enough spill could warrant an Emergency Release
Report under Section 304.

SECTION 313 - List of Toxic Chemicals (40 CFR 372)

(REGULATORY INFORMATION - Continued)

The material is not known to contain chemical(s) at a level of 1.0% or greater (0.1% for carcinogens) on the list of Toxic Chemicals and subject to toxic chemical release reporting requirements.

TOXIC SUBSTANCES CONTROL ACT (TSCA) (40 CFR 710)

The material is a mixture as defined by TSCA. The chemical ingredients in this material are in the Section 8(b) Chemical Substance Inventory (40 CFR 710) and/or are otherwise in compliance with TSCA. In the case of ingredients obtained from other manufacturers, Conoco relies on the assurance of responsible third parties in providing this statement.

RESOURCE CONSERVATION AND RECOVERY ACT (RCRA), 40 CFR 261, SUBPART C AND D

The material, when discarded or disposed of, is not specifically listed as a hazardous waste in Federal regulations; however, it could be considered hazardous if it meets criteria for being toxic, corrosive, ignitable or reactive according to U.S. EPA definitions (40 CFR 261). This material could also become a hazardous waste if it is mixed with or comes in contact with a listed hazardous waste. If it is a hazardous waste, regulations 40 CFR 262-266 and 268 may apply.

FEDERAL WATER POLLUTION CONTROL ACT, CLEAN WATER ACT, 40 CFR 116.4A, Section 311

The material contains the following ingredient(s) which is considered hazardous if spilled in navigable waters.

Ingredient	: Petroleum Hydrocarbons
Reportable Quantity	: Film or sheen upon or discoloration of the water surface or adjoining shoreline.

HAZARDOUS MATERIALS TRANSPORTATION REGULATIONS, 49 CFR 171-178.

Not Applicable

FOREIGN REGULATIONS

CANADIAN PRODUCTS ACT (WHMIS)

The material is not a WHMIS Controlled Product.

STATE REGULATIONS

CALIFORNIA SAFE DRINKING WATER AND TOXIC ENFORCEMENT ACT OF 1986 ("PROPOSITION 65")

The material contains ingredient(s) known to the State of California to cause cancer, birth defects or other reproductive harm. Read and follow label directions and use care when handling or using all petroleum products.

(REGULATORY INFORMATION - Continued)

Ingredient(s) : Formaldehyde (<0.00025%)
Ethyl Acrylate (<0.00025%) as residue

PENNSYLVANIA WORKER AND COMMUNITY RIGHT-TO-KNOW ACT
This material is not known to contain any ingredient(s)
subject to the Act. Nonhazardous ingredient(s)
information is withheld as trade secret in accordance
with Section 11 of the Pennsylvania Worker and Community
Right-to-Know Act.

The above data are based on tests, experience, and other information
which Conoco believes reliable and are supplied for informational
purposes only. However, some ingredients may have been purchased or
obtained from third-party manufactures. In these instances, Conoco,
good faith, relies on information provided by those third parties.
Since conditions of use are outside our control, CONOCO DISCLAIMS ANY
LIABILITY FOR DAMAGE OR INJURY WHICH RESULTS FROM USE OF THE ABOVE
DATA. NOTHING CONTAINED HEREIN SHALL CONSTITUTE A GUARANTEE, WARRANT
(INCLUDING WARRANTY OF MERCHANTABILITY) OR REPRESENTATION (INCLUDING
FREEDOM FROM PATENT LIABILITY) BY CONOCO WITH RESPECT TO THE DATA, TH
MATERIAL DESCRIBED, OR ITS USE FOR ANY SPECIFIC PURPOSE, EVEN IF THAT
PURPOSE IS KNOWN TO CONOCO.

Responsibility for MSDS : Safety, Health, & Env. Affairs
Conoco Inc.
PO Box 2197
Houston, TX 77252
713/293-5550

End of MSDS

14-169

14-169

14-169

14-169-38

ENVIRONMENTAL: PRIOR

SAFETY: PRIOR

HAZARD: PRIOR

HAZARD: PRIOR

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MATERIAL SAFETY DATA SHEET (FISHER 301)



HAZARD RATING: 10
Please refer to MSDS for P.A. Code

SECTION I NAME AND PRODUCT

MANUFACTURER'S NAME NORTON COMPANY, PERFORMANCE PLASTICS	CONTACT ROBERT CHARTON
ADDRESS (STREET, CITY, STATE AND ZIP CODE) 2664 GILCHRIST RD., AKRON, OH 44305	EMERGENCY TELEPHONE NO. 216-798-9240
TRADE NAME, COMMON NAME OR SPECIFICATION TYGON® R-3603	APPROVED BY R.A.C. DATE 4/88
CHEMICAL FAMILY OR PRODUCT TYPE POLYVINYL CHLORIDE/COMPOUNDED ORGANIC POLYMER	

SECTION II COMPOSITION

CHEMICAL NAME CONTAINS:	COMMON NAME	REG. (Y/N)	CAS #	OSHA PERMISSIVE EXPOSURE LIMIT	ACGIH TLV	CARCIN- OGEN* (Y/N)
DI-2-ETHYLHEXYL PHTHALATE	DOP OR DEHP	Y	117-81-7	5 MG/M ³ TWA	5 MG/M ³ TWA 10 MG/M ³ STEL	SUSPECT

ALL ADDITIVES ARE PHYSICALLY BOUND IN THE MANUFACTURING PROCESS & ARE NOT EXPECTED TO CREATE ANY HAZARD WHEN THE PRODUCT IS USED & HANDLED IN ACCORDANCE WITH NORMAL MANUFACTURING & INDUSTRIAL HYGIENE PRACTICE & BY FOLLOWING THE GUIDELINES ON THIS SHEET.

IN REFERENCE TO 40CFR, SECTION 313, PART 372, COMMUNITY RIGHT TO KNOW, WE CLASSIFY TYGON® TUBING AS AN "ARTICLE" & THEREFORE NOT SUBJECT TO NOTIFICATION REQUIREMENTS.

* Materials are regulated by OSHA 29 CFR 1910.1200, Hazard Communication Standard, and/or the Massachusetts General Law Chapter 111F, Right To Know Regulations

SECTION III PHYSICAL AND CHEMICAL DATA

BOILING POINT NA	MELTING POINT NA	SPECIFIC GRAVITY 1.18
VAPOR PRESSURE 7 X 10 ⁻⁸ MM HG 20°C	PERCENT VOLATILE BY VOL NA	VAPOR DENSITY NA
EVAPORATION RATE NA	SOLUBILITY IN WATER NEGLIGIBLE	SOLUBILITY IN ALCOHOL NAIF
SOLUBILITY IN OTHER SOLVENT NAIF		APPEARANCE AND ODOR CLEAR TUBING; SLIGHT ODOR

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT 500°F	(METHOD USED) ASTM D1929	FLAMMABLE LIMITS LEL NA UEL NA
EXTINGUISHING MEDIA WATER		
SPECIAL FIRE FIGHTING PROCEDURES SELF-CONTAINED BREATHING APPARATUS FOR FIRES IN CLOSED AREAS		
EXPLOSION POTENTIAL NAIF		

SECTION V HEALTH, FIRST AID AND MEDICAL DATA

PRIMARY ROUTE(S) OF ENTRY	ACUTE AND CHRONIC HEALTH EFFECTS AND EFFECTS OF OVEREXPOSURE	FIRST AID AND MEDICAL INFORMATION
INHALATION	NONE KNOWN AT NORMAL AMBIENT USE TEMPS. ABOVE 300°F, FUMES OR VAPORS MAY BE EMITTED THAT ARE IRRITATING TO RESPIRATORY TRACT, EYES OR SKIN OF SOME SENSITIVE PEOPLE.	IF IRRITATION OCCURS, REMOVE AFFECTED INDIVIDUAL FROM AREA; REFER TO PHYSICIAN.
INGESTION	NA	
SKIN CONTACT & ABSORPTION	AT NORMAL CONDITIONS OF USE, NONE KNOWN.	
EYE	NA	
OTHER POTENTIAL HEALTH RISKS		

SECTION VI CORROSIVITY AND REACTIVITY DATA

STABILITY UNSTABLE ☐ STABLE ☒ POLYMERIZATION MAY OCCUR ☐ WILL NOT OCCUR ☒

COMPATIBILITY (MATERIALS TO AVOID)

NONE KNOWN

DECOMPOSITION PRODUCTS

WHEN FORCED TO BURN, PVC COMPOUNDS WILL MAINLY CONTRIBUTE CO, CO₂ & HCl AS GASES AND SMOKE.

CONDITIONS TO BE AVOIDED

TEMPERATURES ABOVE 300°F WILL SLOWLY DECOMPOSE THE TUBING MATERIAL RESULTING IN THE LIBERATION OF HCl GAS.

SECTION VII STORAGE, HANDLING AND USE PROCEDURES

NORMAL STORAGE AND HANDLING

NORMAL CLEANLINESS. ISOLATION IN STORAGE FROM LARGE AMOUNTS OF EASILY COMBUSTIBLE MATERIALS, HEAT AND IGNITION SOURCES IS DESIRABLE.

NORMAL USE

NA

STEPS TO BE TAKEN IN CASE OF LEAKS OR SPILLS

NA

WASTE DISPOSAL METHOD

COMMERCIAL LANDFILL OR INCINERATION THAT COMPLY WITH LOCAL, STATE AND FEDERAL ENVIRONMENTAL CONTROL REGULATIONS.

SECTION VIII PERSONAL PROTECTION INFORMATION

RESPIRATORY PROTECTION (SPECIFY TYPE) NONE REQUIRED DURING NORMAL HANDLING

VENTILATION	LOCAL	NA
	MECHANICAL (GENERAL)	NA
	OTHER	NA

PROTECTIVE GLOVES NA

EYE PROTECTION NA

OTHER EQUIPMENT NA

MEASURES TO BE TAKEN DURING REPAIR AND MAINTENANCE OF CONTAMINATED EQUIPMENT THAT HAS BEEN IN CONTACT WITH THIS MATERIAL

NA

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE SEE SECTION VII

OTHER PRECAUTIONS NA

FOR COMPANY USE

The information and recommendations set forth herein are taken from sources believed to be accurate as of the date hereof; however, Norton Company makes no warranty with respect to the accuracy of the information or the suitability of the recommendations, and assumes no liability to any user thereof.

MATERIAL SAFETY DATA

10101

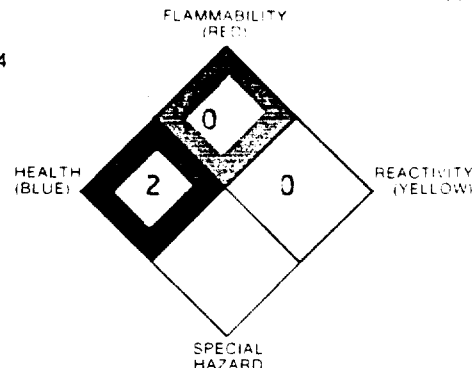
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NFPA Designation 704

TRISODIUM PHOSPHATE CRYSTALS

DEGREE OF HAZARD

4 = EXTREME
3 = HIGH
2 = MODERATE
1 = SLIGHT
0 = INSIGNIFICANT



EMERGENCY TELEPHONES:

PLANTS: (913) 749-8100 LAWRENCE, KS
(201) 541-4171 CARTERET, NJ
CHEMTREC: (800) 424-9300 TRANSPORTATION
MEDICAL: (303) 595-9048 ROCKY MTN

REVISION: 3

EFFECTIVE: 06/09/87

PRINTED: 04/27/83

PREPARED FOR USE BY.....

CERRO COPPER
HIGHWAY 3
ALTON & SOUTHERN RR
SAUGET IL 62202

INFORMATION PROVIDED BY...

FMC CORPORATION
2000 MARKET STREET
PHILADELPHIA PA 19103

SYNONYMS.....

TRISODIUM PHOSPHATE DODECAHYDRATE,
TSP CRYSTALS, TSP CRYSTALLINE

SHIPPING NAME - DOT.....

SODIUM PHOSPHATE, TRIBASIC

IATA.....

SODIUM PHOSPHATE, TRIBASIC

IMCO.....

SODIUM PHOSPHATE, TRIBASIC

FORMULA.....

NA₃PO₄ - 12H₂O - 1/4 NaOH

CHEMICAL FAMILY.....

PHOSPHATE

PRECAUTIONARY STATEMENT...:
(PLEASE USE THIS STATEMENT
TO SATISFY THE IN-PLANT
LABELING REQUIREMENTS
OF THE OSHA HAZARD
COMMUNICATIONS STANDARD
29CFR 1910.1200)

HEALTH: AIRBORNE DUST IS IRRITATING TO NOSE AND
THROAT. DIRECT CONTACT WITH EYE MAY PRODUCE
IRRITATION.
FIRST AID: FLUSH EYES WITH WATER FOR AT LEAST
15 MINUTES. WASH SKIN WITH WATER.
HANDLING: USE NIOSH/MSHA APPROVED RESPIRATORY
PROTECTION AND CHEMICAL GOGGLES IF AIRBORNE
DUST IS EXPECTED.

INGREDIENTS

CAS# AND COMPONENT.....

MATERIAL OR COMPONENT: TRISODIUM PHOSPHATE
CRYSTALS
PERCENT : 100
CAS# : 10101-89-0

CERRO COPPER PRODUCTS COMPANY
MSDS NUMBER - CCPC-00-0267
APPROVALS:
ENVIRONMENTAL: (PRIOR)
SAFETY: (PRIOR)
PURCHASING: (PRIOR)

MATERIAL SAFETY DATA

10101

89 0

NFPA Designation 704

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HEALTH
(BLUE)FLAMMABILITY
(RED)REACTIVITY
(YELLOW)SPECIAL
HAZARD

EMERGENCY TELEPHONES:

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===== PHYSICAL DATA =====

MELTING POINT.....: 75C, -4H2O 95C
 BOILING POINT.....: NOT APPLICABLE
 VAPOR PRESSURE.....: NON-VOLATILE
 VAPOR DENSITY (AIR - 1)...: NON-VOLATILE
 ROOM TEMPERATURE
 APPEARANCE AND STATE: WHITE CRYSTALS
 ODOR.....: NONE
 SPECIFIC GRAVITY (H2O =1): BULK DENSITY 0.9 G/ML
 SOLUBILITY IN H2O % BY WT: 33 @ 25C
 % VOLATILES BY VOLUME.....: NON-VOLATILE
 EVAPORATION RATE
 (BUTYL ACETATE = 1)..: NON-VOLATILE
 PH (AS IS).....: NOT APPLICABLE
 PH (1% SOLUTION).....: 11.9

===== FIRE, EXPLOSION AND REACTIVITY DATA =====

FLASH POINT.....: NON COMBUSTIBLE
 AUTOIGNITION TEMPERATURE.: NON COMBUSTIBLE
 FLAMMABLE LIMITS UPPER...: NOT APPLICABLE
 (AIR) LOWER...: NOT APPLICABLE
 EXTINGUISHING MEDIA.....: NOT APPLICABLE
 SPECIAL FIREFIGHTING.....: NOT APPLICABLE
 PROCEDURES
 DEGREE OF FIRE AND: NONE
 EXPLOSION HAZARD
 STABILITY.....: STABLE
 HAZARDOUS POLYMERIZATION.: WILL NOT OCCUR
 CONDITIONS TO AVOID.....: NONE
 MAJOR CONTAMINANTS THAT...: NONE
 CONTRIBUTE TO INSTABILITY
 INCOMPATIBILITY.....: NONE
 HAZARDOUS DECOMPOSITION...: NONE
 PRODUCTS

MATERIAL SAFETY DATA

10101

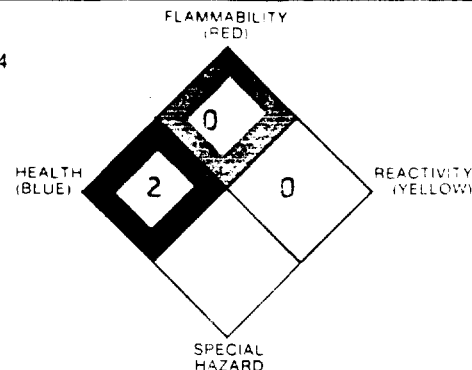
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=====	ROUTES OF EXPOSURE =====
EYE CONTACT.....	EXTREMELY IRRITATING TO UNWASHED EYES; MODERATELY IRRITATING TO WASHED EYES (RABBIT). THESE DATA ARE FOR TRISODIUM PHOSPHATE ANHYDROUS.
SKIN CONTACT.....	SOURCE: FMC REPORT I86-0926 DATE: 1987 MINIMALLY IRRITATING AT 300 AND 20 MG/KG (RABBIT). THESE DATA ARE FOR TRISODIUM PHOSPHATE ANHYDROUS. SOURCE: FMC REPORT I87-0956 DATE: 1987
SKIN ABSORPTION.....	PRACTICALLY NONTOXIC, LD50 GREATER THAN 300 MG/KG (RABBIT). THESE DATA ARE FOR TRISODIUM PHOSPHATE ANHYDROUS. SOURCE: FMC REPORT I87-0956 DATE: 1987
INHALATION.....	SMALL AMOUNTS OF DUST VERY IRRITATING. SUGGESTED 15 MINUTE TIME-WEIGHTED AVERAGE = 5 MG/M3. SOURCE: AIHA J. 43, NO. 10, 1982.
INGESTION.....	SLIGHTLY TOXIC 20% AQUEOUS SOLUTION LD 50 (RAT) = 6.5 G/KG. SOURCE: AIHA J. 43, NO. 10, 1982 DATE: 1979
=====	EXPOSURE LIMITS =====
	NONE PROMULGATED
=====	EFFECTS OF OVEREXPOSURE =====
ACUTE EXPOSURE.....	INHALATION OF HEAVY DUST MAY SEVERELY IRRITATE NOSE AND THROAT. INGESTION MAY INJURE MOUTH, THROAT, AND GASTROINTESTINAL TRACT. CONTACT WITH EYES PRODUCES EXTREME IRRITATION.
CHRONIC EXPOSURE.....	ALTHOUGH NO LONG TERM HUMAN STUDIES HAVE BEEN REPORTED, THERE ARE NO REPORTED CHRONIC EFFECTS THAT WARRANT CONTROL BEYOND THAT REQUIRED TO AVOID IRRITATION FROM AIRBORNE DUST.

MATERIAL SAFETY DATA

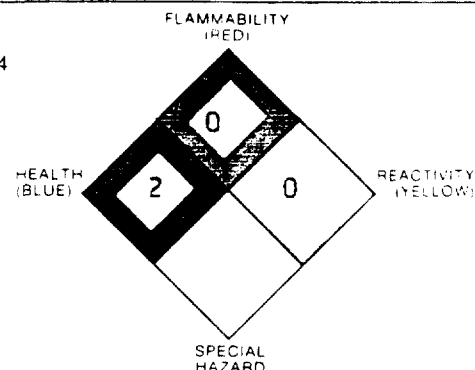
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===== EMERGENCY AND FIRST AID PROCEDURES =====

EYES.....: FLUSH EYES WITH LARGE AMOUNTS OF WATER FOR AT LEAST 15 MINUTES, LIFTING UPPER AND LOWER LIDS INTERMITTENTLY. SEE AN OPHTHALMOLOGIST.

SKIN.....: WASH WITH WATER. IF IRRITATION OCCURS AND PERSISTS, CALL A PHYSICIAN.

INHALATION.....: REMOVE FROM EXPOSURE. FOR BREATHING DIFFICULTY OR DISCOMFORT, OBTAIN MEDICAL ATTENTION.

INGESTION.....: RINSE MOUTH WITH WATER, GIVE WATER TO CAUSE PARTICLES TO DISSOLVE. ~~DO NOT CAUSE VOMITING.~~ CALL A PHYSICIAN.

DECONTAMINATION PROCEDURE: WASH WITH SOAP AND WATER.

NOTES TO PHYSICIAN.....: STRONGLY ALKALINE, MAY REMOVE SEBACEOUS OILS LEAVING SKIN UNPROTECTED AND MAY CAUSE CHEMICAL BURNS. ACCESSIBLE EXPOSED TISSUES SHOULD BE FLUSHED THOROUGHLY WITH WATER, AND ANY CORNEAL BURNS WARRANT CONSULTATION OF AN OPHTHALMOLOGIST. INGESTION MAY RESULT IN NAUSEA, VOMITING, AND BURNS, ESPECIALLY OF THE ESOPHAGUS. ATTEMPTS TO NEUTRALIZE INGESTED MATERIAL WITH ACIDS IS NOT RECOMMENDED. THIS MAY CAUSE EXCESS HEAT AND GAS PRODUCTION WHICH CAN INCREASE THE RISK OF PERFORATION. DILUTION MAY DO LIKEWISE, BUT WHEN THE DRY MATERIAL IS INGESTED, ADHERENCE OF PARTICLES TO THE ESOPHAGEAL MUCOSA MAY ASSURE PERFORATION SO THAT IMMEDIATE DRINKING OF COLD WATER OR MILK IS ADVISED. BURNS OF THE ESOPHAGUS AND/OR STOMACH SUFFICIENT TO LEAD TO PERFORATION AND/OR STRICTURE FORMATION MAY OCCUR WITHOUT OROPHARYNGEAL BURNS. ACCORDINGLY, MOST AUTHORITIES RECOMMEND LIMITED ESOPHAGOSCOPY SUFFICIENT TO DETERMINE IF DEEP AND/OR CIRCUMFERENTIAL BURNS ARE PRESENT, BECAUSE THEY ARE MOST LIKELY TO RESULT IN ESOPHAGEAL STENOSIS. PREVENTION OF THE LATTER IS CONTROVERSIAL, THOUGH MOST AUTHORITIES FAVOR EARLY CORTICOSTEROID AND/OR PROPHYLACTIC DILATION THERAPY.

MATERIAL SAFETY DATA

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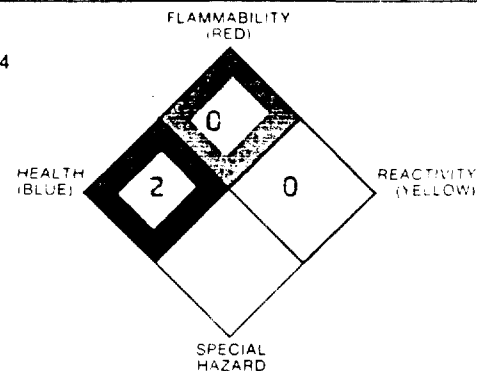
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===== SPECIAL PROTECTION =====

VENTILATION REQUIREMENTS.: USE GENERAL ROOM VENTILATION OR LOCAL EXHAUST VENTILATION IN PROCESSES OR HANDLING WHEN AIRBORNE DUST IS EXPECTED TO BE RELEASED INTO THE WORK ENVIRONMENT.

RECOMMENDED PERSONAL.....: SEE BELOW.
PROTECTIVE EQUIPMENT
RESPIRATORY.....: USE NIOSH/MSHA APPROVED RESPIRATORY PROTECTION, IF AIRBORNE DUST IS EXPECTED.

EYES.....: WEAR CHEMICAL GOGGLES, IF AIRBORNE DUST IS EXPECTED.

GLOVES.....: NO SPECIAL REQUIREMENTS.
SPECIAL CLOTHING...: NO SPECIAL REQUIREMENTS.
AND EQUIPMENT

===== STORAGE AND HANDLING =====

(PLEASE USE THIS STATEMENT TO SATISFY THE IN-PLANT LABELING REQUIREMENTS OF THE OSHA HAZARD COMMUNICATIONS STANDARD 29CFR 1910.1200)

USE NIOSH/MSHA APPROVED RESPIRATORY PROTECTION AND CHEMICAL GOGGLES, IF AIRBORNE DUST EXPECTED.

STORE IN DRY AREA, FOR PRODUCT QUALITY ASSURANCE.

===== DISPOSAL, SPILL OR LEAK PROCEDURES =====

PROCEDURE FOR RELEASE.....: MATERIAL SHOULD BE SWEEPED UP FOR SALVAGE OR DISPOSAL.

WASTE DISPOSAL METHOD.....: IF MATERIAL CAN NOT BE SALVAGED, A METHOD OF DISPOSAL IS IN A LANDFILL IN ACCORDANCE WITH ALL LOCAL, STATE, AND FEDERAL REGULATIONS.

MATERIAL SAFETY DATA

10101

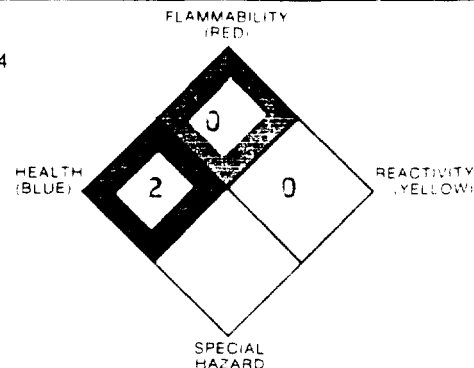
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REVISION: 3

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===== TRANSPORTATION DATA =====

DOT PROPER SHIPPING NAME.: SODIUM PHOSPHATE, TRIBASIC
 DOT CLASSIFICATION..... ORM-E
 DOT LABELS..... NOT REQUIRED
 DOT MARKING..... SODIUM PHOSPHATE, TRIBASIC NA 9148 ORM-E
 DOT PLACARD..... NOT REQUIRED
 UN NUMBER..... NA 9148
 HAZARDOUS SUBSTANCE/RQ... 5000 LBS. (2270 KG)
 49 STCC NUMBER..... 4966383
 EMERGENCY ACCIDENT
 PRECAUTIONS AND PROCEDURE: MATERIAL IS STRONGLY BASIC (ALKALINE); TAKE CARE
 TO AVOID CONTACT WITH PRODUCT, WHICH MAY CAUSE
 IRRITATION, PARTICULARLY TO THE EYES.
 PRECAUTIONS TO BE TAKEN... NONE
 IN TRANSPORTATION
 CMA CHEMCARD NUMBER..... NONE
 TYPE PACKAGES..... NONE
 OTHER SHIPPING IDS..... NONE

===== ADDITIONAL REGULATORY INFORMATION =====

MATERIAL IS REPORTED IN
 EPA TSCA INVENTORY LIST? YES
 MATERIAL IS LISTED AS A
 CARCINOGEN/POTENTIAL
 CARCINOGEN IN FOLLOWING
 NTP ANNUAL REPORT... ? NO
 IARC MONOGRAPHS..... ? NO
 OSHA 29CFR PART 1910
 SUBPART Z ? NO
 FDA GRAS LIST; PERMITTED IN FOOD.



WASTE RESEARCH and RECLAMATION CO., INC.

Material Safety Data Sheet

PRODUCT NAME(S)	1-1-1		
EMERGENCY PHONE NO.	715-834-9624	DOT SHIPPING	1-1-1 Trichloroethane UN2831 (2)
DATE	Revised 10/04/88	STENCILS & SYNONYMS:	DERRO COPPER PRODUCTS COMPANY MSDS NUMBER - DCPD-00-0270
FORMULA	CH ₃ CCl ₃	APPROVALS: ENVIRONMENTAL _____ SAFETY _____ PURCHASING _____	

I. HAZARDOUS INGR

MATERIAL	TLV (PPM)	%	MATERIAL	TLV (PPM)	%
CAS# 71-55-6 1-1-1 Trichloroethane	350	95 +			
CAS# 123-91-1 1,4 Dioxane (skin)	25	2-4			

II. PHYSICAL DATA

BOILING POINT 60 mm Hg (°F)	165°	FREEZING POINT	N/A
SPECIFIC GRAVITY (H ₂ O=1)	1.300-1.322	VAPOR PRESSURE AT 20° C (mm)	100
VAPOR DENSITY (AIR = 1)	4.55	SOLUBILITY IN WATER % BY WT. AT 20°C	0.07
PERCENT VOLATILES BY VOLUME	nearly 100	EVAPORATION RATE (BUTYL ACETATE =1)	over 1
APPEARANCE	Water white.	ODOR	Sweet, sharp odor.

III. FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (TEST METHOD)	None	FLAMMABLE LIMITS IN AIR (% BY VOLUME)	Upper 15
AUTOIGNITION TEMPERATURE	Unknown		Lower 7.5
EXTINGUISHING MEDIA	Water fog.		
SPECIAL FIREFIGHTING PROCEDURES	Self contained breathing equipment should be used by firemen in buildings where 1-1-1 Trichloroethane is stored-keep container cool.		
UNUSUAL FIRE AND EXPLOSION HAZARDS	Vapor can be ignited by high energy ignition source. Decomposes with fire or hot surfaces to acidic gases & other highly toxic substances.		

All information, recommendations and suggestions appearing in this literature concerning the use of our products are based upon tests and data believed to be reliable; however, it is the user's responsibility to determine the suitability for his own use of the products described herein. Since the actual use by others is beyond our control, no guarantee, expressed or implied, is made by Waste Research and Reclamation Co., Inc. as to the effects of such use or the results to be obtained nor does Waste Research and Reclamation Co., Inc. assume any liability arising out of use by others of the products referred to herein. Nor is the information herein to be construed as absolutely complete since additional information may be necessary or desirable when particular or exceptional conditions or circumstances exist or because of applicable laws or government regulations. Nothing herein contained is to be construed as permission or as a recommendation to infringe any patent.

WASTE RESEARCH and RECLAMATION CO., INC.

ROUTE 7 • EAU CLAIRE, WISCONSIN 54701 • (715) 834-9624

IV. HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE	350 ppm Carcinogen: 1,4 Dioxane Medical Condition Aggravated: None found.
EFFECTS OF OVEREXPOSURE	Eyes-Can cause severe irritation, redness, tearing, blurred vision. Skin- Severe irritation. Inhalation-Anesthetic, narcotic effect. Swallowing- Can cause nausea, vomiting, & diarrhea. Aspiration of material into the lungs can cause chemical pneumonitis which can be fatal.
EMERGENCY AND FIRST AID PROCEDURES	Inhalation-remove to fresh air & call physician. Give oxygen or artificial respiration if necessary. Skin contact-wash with soap and water, for irritation call physician. Eye contact-flush with water for 15 minutes, c physician. Ingestion-call physician, have list of ingredients ready.

V. REACTIVITY DATA

STABILITY Unstable <input checked="" type="checkbox"/> Stable	CONDITIONS TO AVOID Open flames, welding arcs-can cause thermo decomposition producing hydrogen chloride phosgene.
INCOMPATIBILITY (Materials To Avoid)	Water-slow hydrolysis produces corrosive acid. Avoid prolonged contact with or storage in aluminum or its alloys. Also, metallic aluminum and zinc powders should be avoided.
Hazardous Decomposition Products	Exposure to high temperature or open flame generates hydrogen chloride and small amounts of phosgene & chloride
Hazardous Polymerization May <input checked="" type="checkbox"/> Will Not Occur Occur	CONDITIONS TO AVOID

VI. SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN MATERIAL IS RELEASED OR SPILLED	Contact proper authorities. Ventilate area. Use proper protective equipment. Small spills-mop, wipe or soak with absorbant materials. Large spills-stop leak at source, prevent spreading, pump to good drums and absorb remaining liquid. Dispose according to Government regulations.
WASTE DISPOSAL METHOD	The spent material can be recycled at Waste Research & Reclamation. Put in steel drums, seal tight and ship to Waste Research & Reclamation. For non-recyclable sludge, incinerate in a licensed chemical waste incinerator.

VII. SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION	Conc. above TLV 350 ppm use self contained breathing apparatus.			
VENTILATIONS	Recommend maintaining airborne concentrations below TLV levels. Use only with adequate ventilation. Provide local exhaust where necessary.			
PROTECTIVE GLOVES	Neoprene, Viton, PVC Coated	EYE PROTECTION , Safety glasses	w/side shield	OTHER PROTECTIVE EQUIPMENT Rubber suit & boots

VIII. SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING	Handle with reasonable care. Avoid breathing vapors in concentrations over 350 ppm with a maximum peak of 500 ppm. Store in cool dry place. Prevent moist air from entering storage. No smoking.
OTHER PRECAUTIONS	None



Conoco Inc.

LUBC0415

Revised 18-Jan-92

Printed 10-Feb-92

UNIVERSAL GEAR LUBRICANT

MATERIAL IDENTIFICATION

Manufacturer/Distributor	Conoco Inc. P.O. Box 2197 Houston, TX: 77252		
Phone Numbers	General Information	1-(713)293-5550	
	Transport Emergency	1-(800)424-9300	
	Medical Emergency	1-(800)441-3637	
Grade	80W-90, 85W-140		
Chemical Family	Petroleum Hydrocarbons		
Trade Names and Synonyms	7650, 7651 UGL		
CAS Number	Mixture		
NFPA Ratings	Health:	0	
	Flammability:	1	
	Reactivity:	0	
NPCA-HMIS Ratings	Health:	1	
	Flammability:	1	
	Reactivity:	0	
	Personal Protection rating to be supplied by user depending on use conditions.		

OSHA HAZARD DETERMINATION

Hazardous Ingredients

Components of this material are not known to be hazardous as defined by OSHA's Hazard Communication Standard, 29 CFR 1910.1200.

PHYSICAL DATA

Boiling Point	750 to 1200°F
Vapor Pressure	Nil

(continued)

PHYSICAL DATA (continued)

Vapor Density	>1 (Air = 1.0)
% Volatiles	Nil
Evaporation Rate	Nil
Water Solubility	Insoluble
Odor	Mild petro. hydrocarbon
Form	Liquid
Color	Dark brown
Specific Gravity	0.89 (Water = 1)

HAZARDOUS REACTIVITY

Instability	Stable.
Incompatibility	Incompatible with strong oxidizing materials. Avoid heat and flame.
Decomposition	Incomplete combustion may produce carbon monoxide.
Polymerization	Polymerization will not occur.

FIRE AND EXPLOSION DATA

Flash Point	295°F
Method	PMCC
Autoignition	680°F
Fire and Explosion Hazards	Class IIIB Combustible Liquid (NFPA).
Extinguishing Media	Water Spray. Foam. Dry Chemical. CO2.
Special Fire Fighting Instructions	<p>Special Fire Fighting Procedures: Water or foam may cause frothing. Use water to keep fire-exposed containers cool. Water spray may be used to flush spills away from exposures.</p> <p>Unusual Fire and Explosion Hazards: Products of combustion may contain carbon monoxide, carbon dioxide and other toxic materials. Do not enter enclosed or confined space without proper protective equipment including respiratory protection.</p>

HEALTH HAZARD INFORMATION

Primary Routes of Exposure/Entry: Skin.

(continued)

HEALTH HAZARD INFORMATION (continued)

Signs and Symptoms of Exposure/Medical Conditions

Aggravated by Exposure:

Mouse skin painting studies have shown that highly solvent-refined petroleum distillates similar to ingredients in this product have not caused skin tumors. The product, as with many petroleum products, may cause minor skin, eye, or lung irritation, especially if poor hygienic practices or inadequate engineering design allow prolonged or repeated exposure.

Carcinogenicity	None of the components in this material is listed by IARC, NTP, OSHA, or ACGIH as a carcinogen.
<hr/>	
Exposure Limits	
UNIVERSAL GEAR LUBRICANT	
TLV (ACGIH)	None Established
PEL (OSHA)	None Established
<hr/>	
Safety Precautions	Wash thoroughly after handling. Wash clothing after use.

FIRST AID

Inhalation	If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician.
<hr/>	
Skin Contact	The compound is not likely to be hazardous by skin contact, but cleansing the skin after use is advisable. If irritation develops, consult a physician.
<hr/>	
Eye Contact	In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Call a physician.
<hr/>	
Ingestion	If swallowed, do not induce vomiting. Immediately give two glasses of water. Never give anything by mouth to an unconscious person. Call a physician.
<hr/>	
Notes to Physician	Activated charcoal slurry may be administered. To prepare activated charcoal slurry, suspend 50 grams activated charcoal in 400mL water and mix thoroughly. Administer 5mL/kg, or 350mL for an average adult.

PROTECTION INFORMATION

Generally Applicable Control Measures and Precautions

Ventilation: Normal shop ventilation.

Personal Protective Equipment	Respiratory Protection: None required except under unusual circumstances such as described in the Fire and Explosion Section.
	Protective Gloves: None required.
	Eye Protection: None required.
	Safety Precautions: Avoid prolonged skin contact by practicing good personal hygiene and laundering contaminated clothing.

(continued)

SPILL, LEAK AND DISPOSAL INFORMATION

Spill, Leak, or Release

NOTE: Review FIRE AND EXPLOSION HAZARDS and SAFETY PRECAUTIONS before proceeding with clean up. Use appropriate PERSONAL PROTECTIVE EQUIPMENT during clean up. Dike spill. Prevent liquid from entering sewers, waterways or low areas. Recover free liquid for reuse or reclamation. Soak up with sawdust, sand, oil dry or other absorbent material.

Waste Disposal

Treatment, storage, transportation and disposal must be in accordance with applicable Federal, State/Provincial, and Local regulations. Recover nonusable free liquid and dispose of in an approved and permitted incinerator. Do not flush to surface water or sanitary sewer system.

SHIPPING INFORMATION

DOT

Proper Shipping Name

Not regulated.

IATA/IMO

Proper Shipping Name

Not restricted.

STORAGE CONDITIONS

Store in accordance with National Fire Protection Assn regulations.

TITLE III HAZARD CLASSIFICATIONS

Acute No

Chronic No

Fire No

Reactivity No

Pressure No

REGULATORY INFORMATION

OSHA HAZARD DETERMINATION

The material is not known to be hazardous as defined by OSHA's Hazard Communication Standard, 29 CFR 1910.1200.

EPA DETERMINATIONS

CLEAN AIR ACT, 40 CFR 50, SECTIONS 112, 114

The material is not known to contain either a Hazardous Air Pollutant or a Volatile Organic Chemical.

(continued)

REGULATORY INFORMATION (continued)

COMPREHENSIVE ENVIRONMENTAL RESPONSE, COMPENSATION, & LIABILITY ACT (CERCLA/SUPREFUND), 40 CFR 302
Not applicable; this material is covered by the CERCLA petroleum exclusion. Releases are not reportable.

SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT OF 1986, TITLE III (SARA) - SECTIONS 302, 304, 313

SECTION 302/304 - Extremely Hazardous Substances (40 CFR 355)

The material is not known to contain extremely hazardous substances at greater than 1.0% concentration; however, it is possible that this material may contain extremely hazardous substances at a lower concentration so that a large enough spill could warrant an Emergency Release Report under Section 304.

SECTION 313 - List of Toxic Chemicals (40 CFR 372)

The material is not known to contain chemical(s) at a level of 1.0% or greater (0.1% for carcinogens) on the list of Toxic Chemicals and subject to toxic chemical release reporting requirements.

TOXIC SUBSTANCES CONTROL ACT (TSCA) (40 CFR 710)

The material is a mixture as defined by TSCA. The chemical ingredients in this material are in the Section 8(b) Chemical Substance Inventory (40 CFR 710) and/or are otherwise in compliance with TSCA. In the case of ingredients obtained from other manufacturers, Conoco relies on the assurance of responsible third parties in providing this statement.

RESOURCE CONSERVATION AND RECOVERY ACT (RCRA), 40 CFR 261, SUBPART C AND D

The material, when discarded or disposed of, is not specifically listed as a hazardous waste in Federal regulations; however, it could be considered hazardous if it meets criteria for being toxic, corrosive, ignitable or reactive according to U.S. EPA definitions (40 CFR 261). This material could also become a hazardous waste if it is mixed with or comes in contact with a listed hazardous waste. If it is a hazardous waste, regulations 40 CFR 262-266 and 268 may apply.

FEDERAL WATER POLLUTION CONTROL ACT, CLEAN WATER ACT, 40 CFR 116.4A, Section 311

The material contains the following ingredient(s) which is considered hazardous if spilled in navigable waters.

Ingredient	: Petroleum Hydrocarbons
Reportable Quantity	: Film or sheen upon or discoloration of the water surface or adjoining shoreline.

FOREIGN REGULATIONS

(continued)

REGULATORY INFORMATION (continued)

CANADIAN HAZARDOUS PRODUCTS ACT (WHMIS)
The material is not a WHMIS Controlled Product.

STATE REGULATIONS

CALIFORNIA SAFE DRINKING WATER AND TOXIC ENFORCEMENT ACT
OF 1986 ("PROPOSITION 65")
The material is not known to contain ingredient(s)
subject to the Act.

PENNSYLVANIA WORKER AND COMMUNITY RIGHT TO KNOW ACT
This material is not known to contain any ingredient(s)
subject to the Act. Non-hazardous ingredient(s)
information is withheld as trade secret in accordance
with Section 11 of the Pennsylvania Worker and
Community Right to Know Act.

ADDITIONAL INFORMATION AND REFERENCES

Product Use: Petroleum Lubricating Oil

The above data are based on tests, experience, and other information which Conoco believes reliable and are supplied for informational purposes only. However, some ingredients may have been purchased or obtained from third-party manufacturers. In these instances, Conoco, in good faith, relies on information provided by those third parties. Since conditions of use are outside our control, CONOCO DISCLAIMS ANY LIABILITY FOR DAMAGE OR INJURY WHICH RESULTS FROM USE OF THE ABOVE DATA. NOTHING CONTAINED HEREIN SHALL CONSTITUTE A GUARANTEE, WARRANTY (INCLUDING WARRANTY OF MERCHANTABILITY) OR REPRESENTATION (INCLUDING FREEDOM FROM PATENT LIABILITY) BY CONOCO WITH RESPECT TO THE DATA, THE MATERIAL DESCRIBED, OR ITS USE FOR ANY SPECIFIC PURPOSE, EVEN IF THAT PURPOSE IS KNOWN TO CONOCO.

Responsibility for MSDS:

Safety, Health, & Env. Affairs
Conoco Inc.
PO Box 2197
Houston, TX 77252
713/293-5550

End of MSDS

MATERIAL SAFETY DATA SHEET

SAHARA OIL COMPANY OF AMERICA, INC.

3516 Greenwood Blvd.
St. Louis, Mo 63143
Phone: (314) 781-4002

Date: 12-3-90

SECTION I - IDENTITY

Product Name: Aqua Sol
Chemical Family: Petroleum Hydrocarbon
Formula: Proprietary

SECTION II - INGREDIENTS

	%	TLV(ACGIH)
Petroleum Hydrocarbon		(for misting) 5mg/M3
Petroleum Sulfonate Mixture		

Note: This product contains no components listed as a carcinogen by N.T.P., I.A.R.C., or OSHA.

SECTION III - PHYSICAL DATA

Boiling Point (F): Less than 500°F
Vapor Pressure: NA
Vapor Density: 4.5
Specific Gravity (H2O = 1): .87
Melting Point (F): NA
Evaporation Rate: NA
Solubility in Water: Complete (pH 8.5 approx.)
Appearance and Odor: Light amber, hydrocarbon odor

SECTION IV - FIRE & EXPLOSION HAZARD DATA

Flash Point (F): 265°F (COC)
Flammable Limits: NA
Extinguishing Media: Foam, CO2, dry chemical.
Special Fire Fighting Procedures: Wear self-contained breathing gear. Do not use direct stream of water as product will float.
Unusual Fire & Explosion Hazards: Cool fire exposed containers with water.

Product Name: Aqua Sol

SECTION V - REACTIVITY DATA

Stability: Stable

Incompatibility (materials to avoid): Heat, open flames, strong oxidizing materials.

Hazardous Decomposition Products: Carbon monoxide or other unidentified organic compounds may be formed.

Hazardous Polymerization: Will not occur

SECTION VI - HEALTH HAZARD ASSESSMENT

General Information: Not expected to be acutely toxic by ingestion. May be slightly irritating after prolonged skin contact. May cause minor eye irritation. Not expected to be toxic by inhalation. However, breathing oil mist at levels above TLV may cause respiratory irritation.

Respiratory: As above

Protective Clothing: Avoid contact with eyes. Wear safety glasses as appropriate. Wear chemical-resistant gloves and other clothing as required to minimize contact.

Ingestion: Do not induce vomiting. Seek medical advice.

Carcinogenicity:	NTP?	IARC?	OSHA?
	No	No	No

SECTION VII - FIRST AID PROCEDURES:

Skin: Wash with soap and water. If irritation occurs, get medical attention. Do not reuse clothing until cleaned.

Eyes: Flush with large amounts of clear water. If irritation occurs, get medical attention.

Ingestion: Do not induce vomiting. Get medical attention.

Inhalation: Remove victim to fresh air and provide oxygen if breathing is difficult. Get medical attention.

Product Name: Aqua Sol

SECTION VIII - PROCEDURES FOR SAFE HANDLING & USE

Steps to be taken in case material is released or spilled:

Dike and contain. Remove with vacuum trucks or pump to storage vessels. Soak up residue with absorbent. Flush area with water to remove trace residue.

Waste Disposal Method: In accordance with state, local, and federal regulations.

Precautions to be taken in handling and storage: Store in cool, dry place with adequate ventilation. Keep from open flames and high temperatures.

SECTION IX - SPECIAL PRECAUTIONS

Keep liquid and vapor away from heat, sparks, and flame.

SECTION X - CONTROL MEASURES

Respiratory Protection: Not normally needed. If misting occurs, use NIOSH approved respirator.

Ventilation: General, mechanical ventilation.

Protective Gloves: Neoprene or nitrile

Eye Protection: Chemical splash goggles

Other Protective Clothing or Equipment: Normal work clothing

Work/Hygienic Practices: Wash after use

MATERIAL SAFETY DATA SHEET
COPYRIGHT GENERAL ELECTRIC CO.

ISS08

PREPARED BY:
GENERAL ELECTRIC CO.
SILICONE PRODUCTS DIV
WATERFORD, NY 12188

PHONE: (518) 237-3330 (24 HRS)

APPLIED BY:
GENERAL ELECTRIC CO.
SILICONE PRODUCTS DIV
WATERFORD, NY 12188

(518) 237-3330 (24 HRS)

REVISED: 03/05/90
PREPARED: DA POLSINELLI

*** I PRODUCT IDENTIFICATION ***

PRODUCT IDENTIFICATION: ISS08

CHEMICAL FAMILY

SILICONE RUBBER SEALANT

CHEMICAL NAME: SILICONE INDUSTRIAL SEALANT

FORMULA: MIXTURE

*** II PRODUCT COMPONENTS ***

PRODUCT COMPOSITION	APPROX.	ACGIH	OSHA	UNITS	CAS REG
	WGT. %	TLV	PEL		NO.
HAZARDOUS					
ETHYLTRIACTOXYMETHYLSILANE	1-5	10(R)	10(R)	PPM	4253-34-3*
NON-HAZARDOUS					
OLYDIMETHYLSILOXANE	60-80	NA	NA	NA	70131-67-8*
GRADE SECRET COMPONENT	5-10	NA	NA	NA	
R/ SECRET COMPONENT	10-30	10	15	MG/M3	

RELATION INFORMATION:

THIS SPACE RESERVED FOR SPECIAL USE.

*** III PHYSICAL DATA ***

OLYDIMETHYLSILOXANE

 BOILING POINT : (F) (C)
 VAPOR PRESSURE(20 C) : MM HG
 VAPOR DENSITY(AIR=1) :

GRADE SECRET COMPONENT

 BOILING POINT : (F) (C)
 VAPOR PRESSURE(20 C) : MM HG
 VAPOR DENSITY(AIR=1) :

GRADE SECRET COMPONENT

 BOILING POINT : (F) (C)
 VAPOR PRESSURE(20 C) : MM HG
 VAPOR DENSITY(AIR=1) :

*PRODUCT INFORMATION

 BOILING POINT : NA (F) NA (C) % VOLATILE BY VOLUME: 5
 VAPOR PRESSURE(20 C) : NA MM HG EVAPORATION RATE : NEG.
 VAPOR DENSITY(AIR=1) : NA (BUTYL ACETATE=1)
 FREEZING POINT : NA (F) NA (C) SPECIFIC GRAVITY : 1.04
 MELTING POINT : NA (F) NA (C) (WATER=1)
 PHYSICAL STATE : SOLID DENSITY : 1042.5 KG/M3
 COLOR : ACETIC ACID ACID/ALKALINITY : UNKNOWN NEG/G
 CLAR : CLEAR PH : NA
 CORROSION THRESHOLD : 1.0 (PPM)
 SOLUBILITY IN WATER(20C) : INSOLUBLE
 SOLUBILITY IN ORGANIC SOLVENT: SLIGHTLY SOLUBLE, AROMATIC
 ETHER SOLVENT)

ETHYLTRIACTOXYMETHYLSILANE

BOILING POINT : 240 (F) 115.5(C)

VOR PRESSURE(20 C) : UNKNOWN MM HG

VOR DENSITY(AIR=1) : 2

*** IV FIRE AND EXPLOSION DATA ***

ASH FT: NA (F) NA (C) BY NA IGNITION TEMP: NA (F) NA (C)

FLAMMABLE LIMITS IN AIR(NA): LOWER NA UPPER NA

SUITY TO MECHANICAL IMPACT (NA): NA

SUITY TO STATIC DISCHARGE:

SENSITIVITY TO STATIC DISCHARGE IS NOT EXPECTED.

QUENCHING MEDIA:

ALL STANDARD FIREFIGHTING MEDIA

ECAL FIREFIGHTING PROCEDURES:

NONE KNOWN.

*** V REACTIVITY DATA ***

HAZILITY: HAZARDOUS:

UN STABLE UNSTABLE POLYMERIZATION WILL NOT OCCUR

HAZARDOUS DECOMPOSITION/COMBUSTION PRODUCTS:

SILICON DIOXIDE.

ACETIC ACID.

COMPATIBILITY (MATERIALS TO AVOID):

CONTACT WITH OXIDIZING AGENTS.

APPLIES IN UNCURED STATE.

ADDITIONS TO AVOID:

NONE KNOWN.

*** VI HEALTH HAZARD DATA ***

UTE SIGNS/EFFECTS OF OVEREXPOSURE:

GESTION:

MAY BE HARMFUL IF SWALLOWED.

IN CONTACT:

UNCURED PRODUCT CONTACT WILL IRRITATE LIPS/GUMS AND TONGUE.

UNCURED PRODUCT CONTACT MAY IRRITATE THE SKIN.

HALATION:

CAUSES MILD RESPIRATORY IRRITATION.

HARMFUL IF INHALED.

APPLIES ONLY IN UNCURED STATE.

IE CONTACT:

UNCURED PRODUCT CONTACT IRRITATES EYES.

ONAL CONDITIONS AGGRAVATED:

NONE KNOWN.

RESPIRATORY

HER:

ACETIC ACID RELEASED DURING CURING.

RONIC EFFECTS OF OVEREXPOSURE:

NONE KNOWN.

ERGENCY AND FIRST AID PROCEDURES:

GESTION:

RINSE MOUTH WITH WATER SEVERAL TIMES.

IN:

TO CLEAN FROM SKIN; REMOVE COMPLETELY WITH A DRY CLOTH OR PAPER

TOWEL, BEFORE WASHING WITH DETERGENT AND WATER.

HALATION:

MOVE PERSON TO FRESH AIR.

ES:

IN CASE OF CONTACT, IMMEDIATELY FLUSH EYES WITH PLENTY OF WATER

FOR AT LEAST 15 MINUTES AND GET MEDICAL ATTENTION.

OTE TO PHYSICIAN:

NONE KNOWN.

TOXICITY: POLYDIMETHYLSILOXANE

UTE ORAL LD50: MG/KG

UTE DERMAL LD50: MG/KG

UTE INHALATION LC50:

HER:

ES TEST: UNKNOWN

TOXICITY: TRADE SECRET COMPONENT

UTE ORAL LD50: MG/KG

UTE DERMAL LD50: MG/KG

UTE INHALATION LC50:

HER:

ES TEST: UNKNOWN

TOXICITY: TRADE SECRET COMPONENT

UTE ORAL LD50: 3160 (RAT) MG/KG

PRETULE B:
3910.00.10001
1999G

THIS PRODUCT OR ITS COMPONENTS ARE ON THE EUROPEAN INVENTORY OF
EXISTING COMMERCIAL CHEMICALS (EINECS).....

THESE DATA ARE OFFERED IN GOOD FAITH AS TYPICAL VALUES AND NOT AS A PRODUCT SPECIFICATION. NO WARRANTY, EITHER EXPRESSED OR IMPLIED, IS MADE. THE RECOMMENDED HANDLING PROCEDURES ARE BELIEVED TO BE GENERALLY APPLICABLE. HOWEVER, EACH USER SHOULD REVIEW THESE RECOMMENDATIONS IN THE SPECIFIC CONTENT OF THE INTENDED USE.

L = CEILING LIMIT	NEGL = NEGLIGIBLE
EST= ESTIMATED	NF = NONE FOUND
NA = NOT APPLICABLE	UNK = UNKNOWN
NE = NONE ESTABLISHED	REC = RECOMMENDED
ND = NONE DETERMINED	V = RECOMM. BY VENDOR
BY-PRODUCT = REACTION BY- PRODUCT, TSCA INVENTORY	SKN = SKIN
STATUS NOT REQUIRED UNDER 40 CFR PART 720.30(H-2)	TS = TRADE SECRET
ETEL = SHORT TERM EXPOSURE LIMIT	R = RECOMMENDED
	MST = MIST

MATERIAL SAFETY DATA SHEET

CERRO COPPER PRODUCTS COMPANY
MSDS NUMBER - CCPC-00-0279

DATE OF PRINTING: 04/27/90

APPROVALS:

SECTION I

MANUFACTURED BY: GLYPHAL, INC.
 305 EASTERN AVE
 CHELSEA, MA 02150
 TELEPHONE: 617-884-6918
 PRODUCT CLASS: RED INSULATING ENAMEL
 CODE IDENTIFICATION: 1201A
 TRADE NAME: GLYPHAL

ENVIRONMENTAL:

SAFETY:

PURCHASING:

 JWS
 10/15/91

HMIS 2 4 0

SECTION II - HAZARDOUS INGREDIENTS

INGREDIENT	PERCENT BY WEIGHT	ACGIH TLV PPM	OSHA PEL MG/CU.M.
XYLENE CAS NUMBER 1330-20-7 HMIS HEALTH=1 FLAMMABILITY=3 REACTIVITY=0 XYLENE	13.7	100	100
VM&P NHTNA CAS NUMBER 8030-30-6 HMIS HEALTH=2 FLAMMABILITY=3 REACTIVITY=0 ALIPHATIC HYDROCARBON	2.2	300	300
STOODARD SOLVENT CAS NUMBER 64741-41-9 HMIS HEALTH=2 FLAMMABILITY=3 REACTIVITY=0 HYDROCARBON MIXTURE	< 0.1	500	
IRON OXIDE CAS NUMBER 1309-382 HMIS HEALTH=0 FLAMMABILITY=1 REACTIVITY=1 FERRIC OXIDE	3.3		
HYDRATED MAGNESIUM SILICATE CAS NUMBER 14807-96-6 HMIS HEALTH=2 FLAMMABILITY=0 REACTIVITY=0 TALC	6.8	20	
N-ETHYL ETHYL KETONE CAS NUMBER 78-93-3 HMIS HEALTH=2 FLAMMABILITY=3 REACTIVITY=0 N-ETHYL ETHYL KETONE	25.0	200	200
N-BUTANOL CAS NUMBER 71-36-3 HMIS HEALTH=1 FLAMMABILITY=3 REACTIVITY=0 OXYGENATED HYDROCARBON	2.0	50	50
ACETONE CAS NUMBER 67-64-1 HMIS HEALTH=1 FLAMMABILITY=3 REACTIVITY=0 ACETONE	18.0	750	1000
PROPANE (PROPELLANT) CAS NUMBER 74-98-6 HMIS HEALTH=3 FLAMMABILITY=3 REACTIVITY=0 DIMETHYLMETHANE PROPYL HYDRIDE	15.0		1000

REMAINING 14% IS NON-HAZARDOUS ALKYD RESIN.

VM & P (CAS# 8030-30-6), AGENCY OSHA, TYPE STEEL, EXPOSURE LIMIT 400 PPM

N/A MEANS NOT AVAILABLE N/EST MEANS NOT ESTABLISHED

NOT EST MEANS NOT ESTABLISHED

NOT EST MEANS NOT ESTABLISHED

N/A MEANS NOT AVAILABLE NOT EST MEANS NOT ESTABLISHED

SECTION III - PHYSICAL DATA

BOILING RANGE: 132.1 TO 284.0 F
 EVAPORATION RATE: FASTER THAN ETHER
 PERCENT VOLATILE BY VOLUME: 87.4
 WEIGHT PER GALLON: 7.21 POUNDS
 VAPOR PRESSURE: N/A
 SOLUBILITY IN WATER: NEGLIGIBLE
 APPEARANCE AND COLOR: RED LIQUID

VAPOR DENSITY: HEAVIER THAN AIR
 VOC (LESS WATER): 5.49 LBS/GAL
 MELTING POINT: N/A

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

OSHA CATEGORY: FLAMMABLE LIQUID

FLASH POINT: 110°F

LEL: 1.9

UEL: N/A

EXTINGUISHING MEDIA:

CARBON DIOXIDE, DRY CHEMICAL OR FOAM.

F. FUEL FIRE AND EXPLOSION HAZARDS:

Pressure may build up in closed containers that are exposed to heat. Solvent vapors are heavier than air and may travel a considerable distance along the ground to an ignition source and "flash back".

SPECIAL FIRE FIGHTING PROCEDURES:

Water may be ineffective; however, water may be used to cool closed containers that are exposed to heat. Firefighting personnel should wear self-contained breathing apparatus.

SECTION V - HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE: SEE SECTION II

PRIMARY ROUTE(S) OF ENTRY:

INHALATION AND SKIN CONTACT

EFFECTS OF OVEREXPOSURE:

HEADACHE, NAUSEA, DIZZINESS, CONFUSION, IRRITABILITY.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE:

RESPIRATORY DIFFICULTIES OR PREEXISTING SKIN SENSITIZATION.

CARCINOGENICITY:

NONE OF THE COMPONENTS OF THIS PRODUCT ARE REPORTED CARCINOGENS.

EMERGENCY FIRST AID PROCEDURES:

INHALATION: REMOVE TO FRESH AIR. ADMINISTER ARTIFICIAL RESPIRATION OR OXYGEN IF BREATHING IS DIFFICULT.

SKIN: WASH AFFECTED AREA WITH SOAP AND WATER. REMOVE AND LAUNDER CONTAMINATED CLOTHING. CONSULT A PHYSICIAN IF IRRITATION PERSISTS.

EYES: FLUSH IMMEDIATELY WITH LARGE AMOUNTS OF WATER FOR AT LEAST 15 MINUTES. TAKE TO A PHYSICIAN FOR MEDICAL TREATMENT.

INGESTION: CALL A PHYSICIAN IMMEDIATELY.

ACUTE: SKIN AND EYE CONTACT: PRIMARY IRRITATION

CHRONIC: XYLENE CONTAINED IN THIS MATERIAL HAS BEEN FOUND TO CAUSE THE FOLLOWING EFFECTS IN LABORATORY ANIMALS: ANEMIA, LIVER ABNORMALITIES, LIVER AND EYE DAMAGE.

EXISTING LIVER AND/OR KIDNEY DISORDERS MAY BE AGGRAVATED BY EXPOSURE TO XYLENE. REPORTS HAVE ASSOCIATED REPEATED AND PROLONGED OCCUPATIONAL OVEREXPOSURE TO XYLENE WITH PERMANENT BRAIN AND NERVOUS SYSTEM DAMAGE.

SECTION VI - REACTIVITY DATA

STABILITY: NORMALLY STABLE

CONDITIONS TO AVOID:

NONE KNOWN

INCOMPATIBILITY (MATERIALS TO AVOID):

STRONG ACIDS AND BASES

HAZARDOUS DECOMPOSITION PRODUCTS:

BY FIRE: NORMAL PRODUCTS OF INCOMPLETE COMBUSTION.

HAZARDOUS POLYMERIZATION: WILL NOT OCCUR

CONDITIONS TO AVOID:

NONE KNOWN

SECTION VII - SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED:

PROVIDE ADEQUATE VENTILATION. REMOVE ALL POSSIBLE IGNITION SOURCES. ABSORB AND DISPOSE USING NON-SPARKING TOOLS.

ELIMINATE ALL SOURCES OF IGNITION. EVACUATE UNPROTECTED PERSONNEL. WATER SPRAY MAY BE USED, TO CONTAIN RUN-OFF; COVER WITH AN ABSORBENT MATERIAL AND PLACE IN CONTAINERS FOR PROPER DISPOSAL. FLUSH AREA WITH WATER TO REMOVE RESIDUE.

WASTE DISPOSAL METHOD:

DISPOSE IN ACCORDANCE WITH LOCAL APPLICABLE REGULATIONS.

DISPOSE OF USING AN APPROVED INCINERATION PROCESS OR IN ACCORDANCE WITH LOCAL, STATE, AND FEDERAL REGULATIONS REGARDING HEALTH AND POLLUTION.

SECTION VIII - SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION:

IN OUTDOOR OR OPEN AREAS USE BUREAU OF MINES APPROVED MECHANICAL FILTER RESPIRATOR TO REMOVE SOLID AIRBORNE PARTICULATES OF OVERSPRAY. INDOORS, WHERE VENTILATION IS INADEQUATE, USE BUREAU OF MINES APPROVED CHEMICAL-MECHANICAL RESPIRATORS DESIGNED TO REMOVE BOTH

1. PARTICULATE AND VAPOR.

VENTILATION:

PROTECTIVE GLOVES:

RECOMMENDED IF SKIN CONTACT IS LIKELY.

EYE PROTECTION:

CHEMICAL SPLASH GOGGLES RECOMMENDED IF POTENTIAL FOR SPLASH OR EYE CONTACT IS LIKELY.

2. A PROTECTIVE EQUIPMENT:

RECOMMENDED AS NEEDED TO AVOID CONTACT.

SECTION IX - SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING OR STORING:

STORE IN A COOL DRY PLACE AWAY FROM HEAT, SPARKS AND OPEN FLAME. KEEP CONTAINERS CLOSED AND UPRIGHT TO PREVENT LEAKAGE. OUTSIDE OR DETACHED STORAGE IS PREFERRED. INSIDE STORAGE SHOULD BE IN A STANDARD FLAMMABLE LIQUID STOREROOM OR CABINET. METAL CONTAINERS SHOULD BE GROUNDED WHEN TRANSFERRING MATERIAL FROM ONE CONTAINER TO ANOTHER. DO NOT REUSE PRODUCT CONTAINER FOR ANY PURPOSE.

OTHER PRECAUTIONS:

PREPARED BY: TECHNICAL STAFF

REFERENCE DATE: 5/15/89

THE INFORMATION AND RECOMMENDATIONS CONTAINED HEREIN ARE BASED UPON DATA BELIEVED TO BE CORRECT. HOWEVER, NO GUARANTEE OR WARRANTY OF ANY KIND, EXPRESSED OR IMPLIED, IS MADE WITH RESPECT TO THE INFORMATION ABOVE.

TO WHOM IT MAY CONCERN: EFFECTIVE JAN 1, 1989, WE ARE REQUIRED BY SARA TITLE III SECTION 313 OF THE RIGHT TO KNOW LEGISLATION, TO INFORM YOU OF THE PERCENTAGE OF ANY INGREDIENT IN A PRODUCT WHICH IS IN THE 313 LIST OR AS AN LISTING AS A COMPONENT OF A MATERIAL WHICH IS IN A CATEGORY OF CHEMICAL LIST.

PRODUCT: 1201A

GLYPTAL

18.0% ACETONE (CAS# 67-64-1)

2.0% N-BUTANOL (CAS# 71-36-3)

25.0% METHYL ETHYL KETONE (CAS# 78-93-3)

13.7% XYLENE (CAS # 1330-20-7)

IF YOU WILL MULTIPLY YOUR TOTAL PURCHASES FROM US AS WELL AS FROM OTHER SUPPLIERS BY THE PERCENTAGE OF EACH INGREDIENT FOUND IN EACH PRODUCT AND IF THE TOTAL QUANTITY EXCEEDS THE REPORTABLE QUANTITY FOR THAT INGREDIENT YOU ARE REQUIRED TO FILE FORM R REPORTS.

Material Safety Data Sheet

conocoCERRO COPPER PRODUCTS COMPANY
MSDS NUMBER - CCPC-00-0287

APPROVALS:

ENVIRONMENTAL: (PRICP)

HAZARD: (PRICP)

SAFETY: (PRICP)

EFFECT: (PRICP)

Emergency Medical Telephone (800) 441-3637

TRANSFORMER OIL

I. MATERIAL IDENTIFICATION

Name
Transformer Oil**CAS Registry Number**
64742-53-6**Synonyms**
Electrical Insulating Oil**Product Code**
7970**Chemical Family**
Petroleum Hydrocarbons**Transportation Emergency Phone**
1-(800) 424-9300 (Chemtrec)

II. OSHA HAZARD DETERMINATION

The material is not hazardous as defined by OSHA's Hazard Communication Standard, 29 CFR 1910.1200. Refer to Section XI of this MSDS for federal and state regulatory information.

Hazardous Ingredients
None**CAS Registry Number****Concentration****Hazardous Physical Properties**
None

III. PHYSICAL DATA

Appearance and Odor
Clear, water white liquid;
Bland, mild petroleum odor**Specific Gravity ($H_2O = 1$)**
0.88**Boiling Point/Range**
460°F**% Volatiles (by volume)**
Negligible**Vapor Pressure**
<0.01 mm Hg @ 20°C**Solubility in Water**
Negligible**Vapor Density (Air = 1.0)**
> 5**Evaporation Rate (n-Butyl Acetate = 1)**
<0.01

IV. REACTIVITY DATA

Stable: X **Unstable:** _____**Hazardous Decomposition Materials:** Fumes, smoke, carbon monoxide and sulfur oxides, in case of incomplete combustion.**Conditions to Avoid:** Strong oxidants like: liquid chlorine, concentrated oxygen, sodium or calcium hypochlorite.**Hazardous Polymerization:** Will not occur.

V. FIRE AND EXPLOSION HAZARD DATA

LFL: 1% UFL: 7%

Flash Point (Method used): 293°F (COC)

Autoignition Temperature: >400°F

Handle and store in accordance with NFPA procedure for Class IIIB Combustible Liquid.

Extinguishing Media: Use water spray, dry chemical, CO₂, foam.

Special Fire Fighting Procedures: Water or foam may cause frothing. Use water to keep fire-exposed containers cool. Water spray may be used to flush spills away from exposures.

Unusual Fire and Explosion Hazards: Products of combustion may contain carbon monoxide, carbon dioxide and other toxic materials. Do not enter enclosed or confined space without proper protective equipment including respiratory protection.

National Fire Protection Association (NFPA) Classification

Health 1 Fire 1 Reactivity 0

HAZARD RATING

Least-0 Slight-1 Moderate-2
High-3 Extreme-4

VI. TRANSPORTATION AND STORAGE

Storage Conditions: Store in accordance with National Fire Protection Association regulations.

Shipping Information:

DOT: Not Regulated

IATA/IMO: Not Restricted

VII. HEALTH HAZARD INFORMATION

Exposure Limits for Transformer Oil

PEL: None Established

Du Pont AEL: None Established

TLV: None Established

Ceiling Value: None Established

Primary Routes of Exposure/Entry: Skin.

Signs and Symptoms of Exposure/Medical Conditions Aggravated by Exposure:

Health studies have shown that many petroleum hydrocarbons and synthetic lubricants pose potential human health risks which may vary from person to person. As a precaution, exposure to liquids, vapors, mists or fumes should be minimized.

In accordance with the current OSHA Hazard Communication Standard criteria, this product does not require a cancer hazard warning. This is because the product is formulated from base stocks which are severely hydrotreated, severely solvent extracted, and/or processed by mild hydrotreatment and extraction. Alternatively, it may consist of components not otherwise affected by IARC criteria, such as atmospheric distillates or synthetically derived materials, and as such is not characterized by current IARC classification criteria.

Prolonged or repeated skin contact with this product tends to remove skin oils possibly leading to irritation and dermatitis; however, based on human experience and available toxicological data, this product is judged to be neither a "corrosive" nor an "irritant" by OSHA criteria.

Product contacting the eyes may cause eye irritation.

Product has a low order of acute oral and dermal toxicity, but minute amounts aspirated into the lungs during ingestion or vomiting may cause mild to severe pulmonary injury and possibly death.

This product is judged to have an acute oral LD50 (rat) greater than 5 g/kg of body weight, and an acute dermal LD50 (rabbit) greater than 3.16 g/kg of body weight.

Listed as Carcinogen or Potential Carcinogen by:

Material	<u>NTP</u>	<u>IARC</u>	<u>OSHA</u>
	No	No	No

VIII. EMERGENCY AND FIRST AID INFORMATION

Eyes: In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Call a physician.

Skin: In case of contact, immediately wash skin with soap and plenty of water. If irritation develops, consult a physician.

Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician.

Ingestion: If swallowed, do not induce vomiting. Give large quantities of water. Never give anything by mouth to an unconscious person. Call a physician.

Notes to Physician: Gastric lavage by qualified medical personnel may be considered, depending on quantity of material ingested.

IX. SPILL, LEAK AND DISPOSAL INFORMATION

In Case of Spill or Leak: Contain spill immediately in smallest possible area, being careful to avoid potential ignition sources. Recover as much of the product as possible by such methods as vacuuming or other mechanical means. Residual fluids should be recovered by using absorbent materials. Nonrecoverable product, contaminated soil, debris and other materials should be placed in proper containers for ultimate disposal. Avoid washing, draining or directing material to storm or sanitary sewers.

NOTE: Review FIRE AND EXPLOSION HAZARDS before proceeding with clean up. Use appropriate PERSONAL PROTECTIVE EQUIPMENT during clean up.

Waste Disposal Method: Recycle as much of the recoverable product as possible. Treatment, storage, transportation and disposal must be in accordance with applicable Federal, State/Provincial, and Local regulations.

X. PRECAUTIONARY MEASURES

Respiratory Protection: Select appropriate NIOSH-approved respiratory protection where necessary to maintain exposures below the acceptable limits in Section VII. Proper respiratory selection should be determined by adequately trained personnel and based on the contaminant(s), the degree of potential exposure and published respiratory protection factors.

Ventilation: Local exhaust. General mechanical ventilation normally adequate but use local exhaust where necessary to maintain exposures below acceptable limits.

Protective Gloves: Should be worn when any potential exists for skin contact. NBR or neoprene recommended.

Eye Protection: None required.

Other Protective Equipment: Coveralls with long sleeves if splashing is probable. Launder contaminated clothing before reuse.

XI. REGULATORY INFORMATION

FEDERAL REGULATIONS

CERCLA, 40 CFR 302

The material contains the following hazardous substance which, when released in quantities equal to or exceeding the Reportable Quantity, triggers National Response Center notification requirements.

Hazardous Substance

Not Applicable

Reportable Quantity

**SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT OF 1986, TITLE III
SECTIONS 302, 304, 311, 312, 313**

SECTION 302/304 - Extremely Hazardous Substances (40 CFR 355)

The material does not contain extremely hazardous substances at greater than 1.0% concentration; however, it is possible that this material may contain extremely hazardous substances at a lower concentration so that a large enough spill could warrant an Emergency Release Report under Section 304.

SECTION 311/312 - MSDS and Chemical Inventory Reporting Requirements (40 CFR 370)

The material should be reported under the following EPA hazard categories:

<input type="checkbox"/> Immediate (Acute) Health Hazard	<input type="checkbox"/> Sudden Release of Pressure
<input type="checkbox"/> Delayed (Chronic) Health Hazard	<input type="checkbox"/> Reactive
<input type="checkbox"/> Fire	<input checked="" type="checkbox"/> Not Applicable

NOTE: See Section II for the concentration of any ingredients classified as hazardous by OSHA.

SECTION 313 - List of Toxic Chemicals (40 CFR 372)

The material contains the following chemical(s) at a level of 1.0% or greater (0.1% for carcinogens) on the list of Toxic Chemicals and is subject to toxic chemical release reporting requirements.

<u>Toxic Chemical</u>	<u>CAS Registry Number</u>	<u>Approx. Concentration (Upper Bound)</u>
None		

TOXIC SUBSTANCES CONTROL ACT (TSCA), 40 CFR 710

This material is a mixture as defined by TSCA. The chemical ingredients in this material are in Section 8(b) Chemical Substance Inventory and/or are otherwise in compliance with TSCA. In the case of ingredients obtained from other manufacturers, Conoco relies on the assurance of responsible third parties in providing this statement.

RESOURCE CONSERVATION AND RECOVERY ACT (RCRA), 40 CFR 261, SUBPART C AND D

The material, when discarded or disposed of, is not specifically listed as a hazardous waste in Federal regulations; however, it could be considered hazardous if it meets criteria for being toxic, corrosive, ignitable or reactive according to U.S. EPA definitions (40 CFR 261). Additionally, it could be designated as hazardous according to state regulations. This material could also become a hazardous waste if it is mixed with or comes in contact with a listed hazardous waste. If such contact or mixing occurs, check 40 CFR 261 to determine whether it is a hazardous waste. If it is a hazardous waste, Regulations 40 CFR 262, 263, 264 and 268 may apply.

**FEDERAL WATER POLLUTION CONTROL ACT, CLEAN WATER ACT, 40 CFR 401.15,
40 CFR 116**

The material contains the following ingredient(s) which is considered hazardous if spilled in navigable waters.

<u>Ingredient</u>	<u>Reportable Quantity</u>
Petroleum Hydrocarbon	Film or sheen upon or discoloration of the water surface or adjoining shoreline

HAZARDOUS MATERIALS TRANSPORTATION REGULATIONS, 49 CFR 171-178

The material contains the following ingredient(s) which is considered a hazardous substance as defined by 49 CFR 171.8 if spilled while being transported in commerce.

<u>Ingredient</u>	<u>Reportable Quantity</u>
Not Applicable	

STATE REGULATIONS

CALIFORNIA SAFE DRINKING WATER AND TOXIC ENFORCEMENT ACT OF 1986 ("PROPOSITION 65")

The material contains the following ingredient(s) known to the State of California to cause cancer, birth defects or other reproductive harm. Read and follow label directions and use care when handling or using all petroleum products.

Ingredient

None

PENNSYLVANIA WORKER AND COMMUNITY RIGHT TO KNOW ACT

This material does not contain any ingredient(s) subject to the Act. Nonhazardous ingredient(s) information is withheld as trade secret in accordance with Section 11 of the Act.

MSDS Code: LUBP0390

DATE OF LATEST REVISION/REVIEW:

DEPARTMENT RESPONSIBLE FOR MSDS:

PRODUCT INFORMATION CONTACT:

4/89 - Replaces MSDS dated 1/89

Environmental and Occupational Health Services

MSDS Analyst

Conoco Inc.

(713) 293-5550

The above data are based on tests, experience, and other information which Conoco believes reliable and are supplied for informational purposes only. However, some ingredients may have been purchased or obtained from third-party manufacturers. In these instances, Conoco, in good faith relies on information provided by those third parties. Since conditions of use are outside our control, CONOCO DISCLAIMS ANY LIABILITY FOR DAMAGE OR INJURY WHICH RESULTS FROM THE USE OF THE ABOVE DATA. NOTHING CONTAINED HEREIN SHALL CONSTITUTE A GUARANTEE, WARRANTY (INCLUDING WARRANTY OF MERCHANTABILITY) OR REPRESENTATION (INCLUDING FREEDOM FROM PATENT LIABILITY) BY CONOCO WITH RESPECT TO THE DATA, THE MATERIAL DESCRIBED, OR ITS USE FOR ANY SPECIFIC PURPOSE, EVEN IF THAT PURPOSE IS KNOWN TO CONOCO.

CONOCO

Material Safety Data Sheet

May be used to comply with
OSHA's Hazard Communication Standard,
29 CFR 1910.1200. Standard must be
consulted for specific requirements.

ENVIRONMENTALLY FRIENDLY
SAFETY
PURCHASING

Form Approved
OMB No. 1218-0072

IDENTITY (As Used on Label and List)
SAND, OR SAND & GRAVEL

Note: Blank spaces are not permitted. If any item is not applicable, or no
information is available, the space must be marked to indicate that.

Section I

Manufacturer's Name MATERIAL SERVICE CORPORATION	Emergency Telephone Number 312-372-3600
Address (Number, Street, City, State, and ZIP Code) 222 NORTH LA SALLE STREET	Telephone Number for Information 312-372-3600
CHICAGO, ILLINOIS 60601	Date Prepared 6/6/89
	Signature of Preparer (optional)

Section II — Hazardous Ingredients/Identity Information

Hazardous Components (Specific Chemical Identity, Common Name(s))	OSHA PEL	ACGIH TLV	Other Limits Recommended	% (optional)
NATURAL SAND OR SAND AND GRAVEL				
DUST MAY CONTAIN RESPIRABLE SILICA PARTICLES CAS 14808-60-7				
EXPOSURE LIMITS ARE EXPRESSED AS MILLIGRAMS OF SUBSTANCE PER CUBIC METER OF AIR (mg/m ³)				
8-HOUR TIME WEIGHTED AVERAGES. RESPIRABLE DUST EXPOSURE LIMITS VARY WITH THE % QUARTZ IN DUST				
DUST < 1% QUARTZ: TOTAL: ACGIH & MSHA = 10, OSHA 15' RESPIRABLE: MSHA & OSHA = 5				
DUST ≥ 1% QUARTZ: TOTAL MSHA = 30 ÷ (% QUARTZ + 3), OSHA = 30 ÷ (% QUARTZ + 2)				
RESPIRABLE: MSHA & OSHA = 10 ÷ (% QUARTZ + 2)				
RESPIRABLE QUARTZ: ACGIH = 0.1 mg/m ³				

Section III — Physical/Chemical Characteristics

Boiling Point	4046°F	Specific Gravity (H ₂ O = 1)	2.6
Vapor Pressure (mm Hg.)	N/A	Melting Point	N/A
Vapor Density (AIR = 1)	N/A	Evaporation Rate (Butyl Acetate = 1)	N/A
Solubility in Water NEGLECTIBLE			
Appearance and Odor ANGULAR OR ROUND MULTICOLORED PARTICLES, ODORLESS			

Section IV — Fire and Explosion Hazard Data

Flash Point (Method Used) N/A	Flammable Limits N/A	LEL N/A	UEL N/A
Extinguishing Media NONE REQUIRED			
Special Fire Fighting Procedures NONCOMBUSTIBLE			
Unusual Fire and Explosion Hazards NONE KNOWN			

Section V — Reactivity Data

Stability	Unstable		Conditions to Avoid	N/A
	Stable	X		N/A
Incompatibility (Materials to Avoid)				
CONTACT WITH POWERFUL OXIDIZING AGENTS SUCH AS FLUORINE, CHLORINE				
Hazardous Decomposition or Byproducts				
SILICA WILL DISSOLVE IN HYDROFLUORIC ACID AND PRODUCE A CORROSIVE GAS SILICON TETRAFLUORIDE				
Hazardous Polymerization	May Occur		Conditions to Avoid	N/A
	Will Not Occur	X		N/A

Section VI — Health Hazard Data

Route(s) of Entry:	Inhalation?	Skin?	Ingestion?
	YES	NO	NO
Health Hazards (Acute and Chronic)			
ACUTE EXPOSURE TO DUST MAY IRRITATE RESPIRATORY SYSTEM, EYES AND SKIN			
CHRONIC EXPOSURE TO RESPIRABLE QUARTZ IN EXCESS OF EXPOSURE LIMITS COULD CAUSE SILICOSIS			

Carcinogenicity:	NTP?	IARC Monographs?	OSHA Regulated?
	NO	NO	NO
IARC HAS DETERMINED THAT THERE IS SUFFICIENT EVIDENCE FOR CARCINOGENICITY TO EXPERIMENTAL ANIMALS EXPOSED TO CRYSTALLINE SILICA (A COMPONENT OF THIS PRODUCT) AND LIMITED EVIDENCE FOR CARCINOGENICITY TO HUMANS "LIMITED EVIDENCE" MEANS THAT A CAUSAL RELATIONSHIP IS POSSIBLE; HOWEVER, OTHER EXPLANATIONS SUCH AS CHANCE, BIAS, OR CONFOUNDING FACTORS CANNOT ADEQUATELY BE EXCLUDED.			

Signs and Symptoms of Exposure

SYMPTOMS OF SILICOSIS MAY INCLUDE SHORTNESS OF BREATH, DIFFICULTY BREATHING WITH/WITHOUT EXERTION, COUGHING, DIMINISHED WORK CAPACITY, REDUCTION OF LUNG VOLUME AND RIGHT HEART ENLARGEMENT

Medical Conditions

Generally Aggravated by Exposure: INHALING RESPIRABLE DUST MAY AGGRAVATE EXISTING RESPIRATORY SYSTEM DISEASE(S) AND/OR DYSFUNCTIONS. EXPOSURE TO DUST MAY AGGRAVATE EXISTING SKIN AND/OR EYE CONDITIONS.

Emergency and First Aid Procedures

INHALATION: REMOVE TO FRESH AIR. EYES: FLUSH WITH WATER, GET MEDICAL ATTENTION
SKIN: WASH WITH SOAP AND WATER

Section VII — Precautions for Safe Handling and Use

Steps to Be Taken in Case Material is Released or Spilled

SPILLED MATERIALS, WHERE DUST CAN BE GENERATED MAY EXPOSE CLEAN-UP PERSONNEL TO RESPIRABLE DUST. WETTING OF SPILLED MATERIAL AND/OR USE OF RESPIRATORY EQUIPMENT MAY BE NECESSARY

Waste Disposal Method

DISPOSE OF WASTE MATERIALS IN ACCORDANCE WITH FEDERAL, STATE AND LOCAL REGULATIONS

Precautions to Be Taken in Handling and Storage

RESPIRABLE DUST MAY BE GENERATED DURING HANDLING AND STORAGE. THE CONTROL MEASURES IDENTIFIED IN SECTION VIII OF THE MSDS SHOULD BE APPLIED

Other Precautions

NONE

Section VIII — Control Measures

Respiratory Protection (Specify Type): NIOSH-MSHA APPROVED DUST RESPIRATOR FOR CONDITIONS WHERE DUST LEVELS EXCEED APPLICABLE EXPOSURE LIMITS

Ventilation	Local Exhaust	USE TO REDUCE DUST CONCENTRATIONS BELOW APPLICABLE EXPOSURE LIMITS	Special	N/A
	Mechanical (General)	USE TO REDUCE DUST CONCENTRATIONS BELOW APPLICABLE EXPOSURE LIMITS	Other	N/A

Protective Gloves

YES, USE TO PREVENT SKIN CONTACT

Eye Protection

YES, SAFETY GLASSES AND/OR GOGGLES

Other Protective Clothing or Equipment

YES, WEAR LONG SLEEVE SHIRT AND LONG PANTS TO PREVENT SKIN CONTACT

Work Hygienic Practices

WASH EXPOSED SKIN WITH SOAP AND WATER, WASH WORK CLOTHES FREQUENTLY

Material Safety Data Sheet



CERRO COPPER PRODUCTS COMPANY
MSDS NUMBER - CCPC-00-0289
APPROVALS:
ENVIRONMENTAL: (PRIOR) _____
SAFETY: (PRIOR) _____
HUMANITARIAN: (PRIOR) _____

Emergency Medical Telephone (800) 441-3637

EP CONOLITH® GREASE 000, 00, 0, #1, #2

I. MATERIAL IDENTIFICATION

Name
EP Conolith® Grease 000, 00, 0, #1, #2

CAS Registry Number
Mixture; See Section XI

Synonyms
Petroleum Grease

Product Code
9447/9449/9450/9451/9453

Chemical Family
Petroleum Hydrocarbon

Transportation Emergency Phone
1-(800) 424-9300 (Chemtrec)

II. OSHA HAZARD DETERMINATION

The material is not known to be hazardous as defined by OSHA's Hazard Communication Standard, 29 CFR 1910.1200. Refer to Section XI of this MSDS for federal and state regulatory information.

III. PHYSICAL DATA

Appearance and Odor
Green-brown solid;
Mild petroleum hydrocarbon odor

Specific Gravity (H₂O = 1)
0.89

Boiling Point/Range
750° - 1200°F

% Volatiles (by volume)
Nil

Vapor Pressure
Nil

Solubility in Water
Insoluble

Vapor Density (Air = 1.0)
>1

Evaporation Rate
Nil

IV. REACTIVITY DATA

Stable: X **Unstable:** ____

Hazardous Decomposition Materials: Hazardous gases/vapors produced are carbon dioxide; incomplete combustion may produce carbon monoxide.

Conditions to Avoid: Strong oxidizing materials, heat and flame.

Hazardous Polymerization: Will not occur.

V. FIRE AND EXPLOSION HAZARD DATA

Flash Point (Method used): 300°F (PMCC)

Autoignition Temperature: 700°F

Handle and store in accordance with NFPA procedure for Class IIIB Combustible Liquid.

Extinguishing Media: Use water spray, dry chemical, CO₂ foam.

Special Fire Fighting Procedures: Water or foam may cause frothing. Use water to keep fire-exposed containers cool. Water spray may be used to flush spills away from exposures.

Unusual Fire and Explosion Hazards: Products of combustion may contain carbon monoxide, carbon dioxide and other toxic materials. Do not enter enclosed or confined space without proper protective equipment including respiratory protection.

National Fire Protection Association (NFPA) Classification

Health 0 Fire 1 Reactivity 0

HAZARD RATING

Least-0 Slight-1 Moderate-2

High-3 Extreme-4

VI. TRANSPORTATION AND STORAGE

Storage Conditions:

Store in accordance with National Fire Protection Association regulations.

Shipping Information:

DOT: Not Regulated

IATA/IMO: Not Restricted

VII. HEALTH HAZARD INFORMATION

PEL: None Established

Ceiling Value: None Established

TLV: None Established

Hazardous Materials Identification System (HMIS) Ratings

Health 1 Fire 1 Reactivity 0

Primary Routes of Exposure/Entry: Skin.

Signs and Symptoms of Exposure/Medical Conditions Aggravated by Exposure:

The product does not pose a significant health hazard, but as with many petroleum products, poor hygienic practices or inadequate engineering design that allow prolonged or repeated exposure may cause minor skin irritation.

Carcinogenicity:

This material is not known to contain any chemical listed as a carcinogen or suspected carcinogen by OSHA, IARC, or NTP at a concentration greater than 0.1%.

VIII. EMERGENCY AND FIRST AID INFORMATION

Eyes: In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Call a physician.

Skin: In case of contact, immediately wash skin with soap and plenty of water. Wash contaminated clothing before reuse. If irritation develops, consult a physician.

Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician.

Ingestion: If swallowed, do not induce vomiting. Immediately give two glasses of water. Never give anything by mouth to an unconscious person. Call a physician.

Notes to Physician: Activated charcoal slurry may be administered. To prepare activated charcoal slurry, suspend 50 grams activated charcoal in 400mL water and mix thoroughly. Administer 5mL/kg, or 350mL, for an average adult.

IX. SPILL, LEAK AND DISPOSAL INFORMATION

In Case of Spill or Leak: Dike spill. Prevent liquid from entering sewers, waterways, or low areas. Recover free liquid for reuse or reclamation. Soak up with sawdust, sand, oil dry, or other absorbent material.

NOTE: Review FIRE AND EXPLOSION HAZARDS before proceeding with clean up. Use appropriate PERSONAL PROTECTIVE EQUIPMENT during clean up.

Waste Disposal Method: Treatment, storage, transportation and disposal must be in accordance with applicable Federal, State/Provincial, and Local regulations. Do not flush to surface water or sanitary sewer system.

X. PRECAUTIONARY MEASURES

Respiratory Protection: None required except under unusual circumstances such as described in Section V.

Ventilation: Normal shop ventilation.

Protective Gloves: None required.

Eye Protection: None required.

Safety Precautions: Avoid prolonged skin contact by practicing good personal hygiene and laundering contaminated clothing.

XI. REGULATORY INFORMATION

FEDERAL REGULATIONS

CERCLA, 40 CFR 302

Not Applicable

**SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT OF 1986, TITLE III
SECTIONS 302, 311, 312, 313**

SECTION 302/304 - Extremely Hazardous Substances (40 CFR 355)

The material is not known to contain extremely hazardous substances at greater than 1.0% concentration; however, it is possible that this material may contain extremely hazardous substances at a lower concentration so that a large enough spill could warrant an Emergency Release Report under Section 304.

SECTION 311/312 - MSDS and Chemical Inventory Reporting Requirements (40 CFR 370)

The material should be reported under the following EPA hazard categories:

- | | |
|--|---|
| <input type="checkbox"/> Immediate (Acute) Health Hazard | <input type="checkbox"/> Sudden Release of Pressure |
| <input type="checkbox"/> Delayed (Chronic) Health Hazard | <input type="checkbox"/> Reactive |
| <input type="checkbox"/> Fire | <input checked="" type="checkbox"/> Not Hazardous |

NOTE: See Section II for the concentration of any ingredients classified as hazardous by OSHA.

SECTION 313 - List of Toxic Chemicals (40 CFR 372)

The material contains the following chemical(s) at a level of 1.0% or greater (0.1% for carcinogens) on the list of Toxic Chemicals and is subject to toxic chemical release reporting requirements.

<u>Ingredient</u>	<u>CAS Registry Number</u>	<u>Approx. Concentration (Upper Bound)</u>
Zinc Naphthenate	12001-85-3	1.0%
Zinc Dithiophosphate	Not Available	1.0%

TOXIC SUBSTANCES CONTROL ACT (TSCA), 40 CFR 710

This material is a mixture as defined by TSCA. The chemical ingredients in this material are in Section 8(b) Chemical Substance Inventory and/or are otherwise in compliance with TSCA. In the case of ingredients obtained from other manufacturers, Conoco relies on the assurance of responsible third parties in providing this statement.

RESOURCE CONSERVATION AND RECOVERY ACT (RCRA), 40 CFR 261, SUBPART C AND D

The material, when discarded or disposed of, is not specifically listed as a hazardous waste in Federal regulations; however, it could be considered hazardous if it meets criteria for being toxic, corrosive, ignitable or reactive according to U.S. EPA definitions (40 CFR 261). Additionally, it could be designated as hazardous according to state regulations. This material could also become a hazardous waste if it is mixed with or comes in contact with a listed hazardous waste. If such contact or mixing occurs, check 40 CFR 261 to determine whether it is a hazardous waste. If it is a hazardous waste, regulations 40 CFR 262, 263, 264 and 265 may apply.

FEDERAL WATER POLLUTION CONTROL ACT, CLEAN WATER ACT, 40 CFR 116.4A, SECTION 311

The material contains the following ingredient(s) which is considered hazardous if spilled in navigable waters.

<u>Ingredient</u>	<u>Reportable Quantity</u>
Petroleum Hydrocarbon	Film or sheen upon or discoloration of the water surface or adjoining shorelines.

HAZARDOUS MATERIALS TRANSPORTATION REGULATIONS, 49 CFR 171-178

Not Applicable

FOREIGN REGULATION**CANADIAN HAZARDOUS PRODUCTS ACT (WHMIS)**

Not Determined.

STATE REGULATIONS**CALIFORNIA SAFE DRINKING WATER AND TOXIC ENFORCEMENT ACT OF 1986 ("PROPOSITION 65")**

The material is not known to contain ingredient(s) subject to the Act.

PENNSYLVANIA WORKER AND COMMUNITY RIGHT TO KNOW ACT

The material contains the following hazardous substances:

Categories: H = Hazardous Substance ($\geq 1.0\%$)
S = Special Hazardous Substance ($\geq 0.01\%$)
E = Environmental Hazard ($\geq 1.0\%$)

<u>Ingredient</u>	<u>CAS Registry Number</u>	<u>Category</u>
Zinc Naphthenate	12001-85-3	E
Zinc Dithiophosphate	Not Available	E

Nonhazardous ingredient(s) information is withheld as a trade secret in accordance with Section 11 of the Act.

MSDS Code: GREC0120

SECTIONS OF MSDS REVISED:

DATE OF LATEST REVISION/REVIEW:

DEPARTMENT RESPONSIBLE FOR MSDS:

PRODUCT INFORMATION CONTACT:

VII, VIII, XI

7/90 - Replaces MSDS dated 4/89

Safety, Occupational Health & Environmental Affairs

Hazard Communication Analyst

Conoco Inc.

(713) 293-5550

The above data are based on tests, experience, and other information which Conoco believes reliable and are supplied for informational purposes only. However, some ingredients may have been purchased or obtained from third-party manufacturers. In these instances, Conoco, in good faith relies on information provided by those third parties. Since conditions of use are outside our control, CONOCO DISCLAIMS ANY LIABILITY FOR DAMAGE OR INJURY WHICH RESULTS FROM THE USE OF THE ABOVE DATA. NOTHING CONTAINED HEREIN SHALL CONSTITUTE A GUARANTEE, WARRANTY (INCLUDING WARRANTY OF MERCHANTABILITY) OR REPRESENTATION (INCLUDING FREEDOM FROM PATENT LIABILITY) BY CONOCO WITH RESPECT TO THE DATA, THE MATERIAL DESCRIBED, OR ITS USE FOR ANY SPECIFIC PURPOSE, EVEN IF THAT PURPOSE IS KNOWN TO CONOCO.

conoco

MATERIAL SAFETY DATA SHEET (MSDS)
SC-000-042 REV. 5 DATE 08/15/89 CODE

24-4

CONFORMS TO REQUIREMENTS OF OSHA STANDARD 1910.1200
"HAZARD COMMUNICATION" AND TO VARIOUS STATE
"EMPLOYEE RIGHT TO KNOW" LAWS
COPYRIGHT 1989 AMERICAN FOUNDRYMEN'S SOCIETY

SECTION I PRODUCT IDENTIFICATION

This MSDS supplied for: DUCTILE IRON

ASTM ALLOY DESIGNATION

=====

VEHNDOR NAME AND ADDRESS: EUREKA FOUNDRY COMPANY
P.O. BOX 6039
1601 CARTER STREET
CHATTANOOGA, TN 37401

EMERGENCY PHONE NUMBER: 615/267-3328

SECTION II - HAZARDOUS COMPONENTS

INGREDIENT	CAS NO.	PERCENT	TLV	PEL
Carbon	7440-44-0	3.0-4.3	N/E	N/E
Chromium*	7440-47-3	0.02-0.13		
Metal			0.5 mg/cu.m	1 mg/cu.m
Chromium (II) compounds as Cr			0.5 mg/cu.m	0.5 mg/cu.m
Chromium (III) compounds as Cr			0.5 mg/cu.m	0.5 mg/cu.m
Chromium (VI) compounds as Cr				
Water soluble			0.05 mg/cu.m	--
Certain water insoluble			0.05 mg/cu.m	--
Chromic acid and chromates			--	0.1 mg/cu.m

=====

N/E means none established.

N/A means not applicable.

N/D means no data available.

Iron	7439-89-6	87.7-95.1		
Iron oxide fume (Fe ₂ O ₃) as Fe			5 mg/cu.m	--
Iron oxide dust and fume as Fe			---	10 mg/cu.m
Manganese*(as Mn)	7439-96-5	<1.2		
Dust and compounds			5 mg/cu.m	5 mg/cu.m
Fume			1 mg/cu.m	1 mg/cu.m
Nickel*	7440-02-0	0.01-1.5		
Metal			1 mg/cu.m	--
Metal and insoluble compounds as Ni			--	1 mg/cu.m
Soluble compounds as Ni			0.1 mg/cu.m	0.1 mg/cu.m
Silicon	7440-21-3	1.8-4.0		
Total dust			10 mg/cu.m	10 mg/cu.m
Respirable fraction			N/E	5 mg/cu.m

CARCINOGEN CLASSIFICATION

INGREDIENT	OSHA	NTP	IARC	TARGET ORGAN
Chromium	N	Y	3	Lung
Hexavalent	N	Y	1	Lung
Nickel	N	Y	1	Lung, Nasal

Y=LISTED AS HUMAN CARCINOGEN N=NOT LISTED AS HUMAN CARCINOGEN

Code for IARC evidence for human carcinogenicity:
1=positive; 2A=probable; 2B=possible; 3=not classified; 4=probably negative

*This constituent, a toxic chemical, makes this product subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372. Quantity thresholds for this chemical, below which reporting of releases is not required, are 50,000 pounds for 1988, and 25,000 pounds for 1989 and subsequent years.

SECTION III - OVERVIEW

There are no chemical hazards from these castings in solid form.

Dust or fumes generated by machining, grinding, or welding on the casting will put contaminants in the air. Since the casting is over 85% iron, most of the dust or fume will be iron or iron oxide. There is no TLV for iron dust, but available information indicates that the TLV for nuisance dust will serve as a guideline until a TLV is established.

=====

N/E means none est
N,

CERRO COPPER PRODUCTS COMPANY
MSDS NUMBER - CCPC-00-0291

APPROVALS:

ENVIRONMENTAL: _____

SAFETY: _____

PREPARED BY: _____

High production dry machining of ductile iron castings usually requires local exhaust ventilation.

Flame cutting, arc gouging, or welding on the casting generates iron oxide fume. Inhalation of too much iron oxide fume over a long time can cause siderosis, sometimes called "iron pigmentation" of the lung. It can be seen on a chest x-ray but causes little or no disability. Also see the Material Safety Data Sheet for the welding rod being used.

Welding or flame cutting may convert a fraction of the chromium to the water insoluble hexavalent (carcinogenic) form, but the chromium content of the casting is so low that over-exposure is not likely.

Nickel has been shown to cause cancer in laboratory animals. However its potential to cause cancer in humans has not been determined. The nickel content of the casting is so low that over-exposure is not likely.

Grinding on castings that have not been cleaned or that contain embedded silica will generate significant amounts of dust containing free silica, which can cause silicosis. Good local ventilation is frequently required to prevent over-exposure in this situation. If good ventilation is not available, use a NIOSH-approved dust respirator. IARC has listed crystalline silica as Class 2A, probably can cause lung cancer.

Other toxic metals in the alloy are present in small amounts that will not represent a hazard if iron dust and fume are adequately controlled.

SECTION IV - PHYSICAL DATA

PHYSICAL DESCRIPTION: Solid, silver gray in color, no odor
BOILING POINT: 2750 C for iron
VAPOR PRESSURE: N/A
VAPOR DENSITY: N/A
SOLUBILITY IN WATER: N/A
SPECIFIC GRAVITY: 7.86 for iron
PERCENT VOLATILE BY VOLUME: N/A
EVAPORATION RATE: N/A

1/E means none established. N/A means not applicable.
N/D means no data available.

SECTION V - FIRE AND EXPLOSION DATA

Castings will not burn or explode.

SECTION VI - HEALTH HAZARD DATA.

EYES: Metal particles in the eyes may cause irritation if not removed.

SKIN: None known.

BREATHING: Prolonged or repeated overexposure to dust or fumes from these castings may cause the following health effects.

Chromium(hexavalent chromium in fume from welding or arcing): lung cancer

Iron: Siderosis "iron pigmentation" of the lung, which can be seen in a chest x-ray but causes little or no disability

Manganese: Central nervous system effects of sleepiness, weakness in legs, spastic gait, emotional disturbances.

Nickel: Lung and nasal cancer.

Breathing excessive amounts of silica dust for a long time can cause silicosis. Silicosis causes shortness of breath, reduced capacity to do work, and weakens the defenses against other lung diseases.

SWALLOWING: N/A

NOISE: Grinding or machining castings is noisy. The OSHA limit for noise averaged over 8 hours is 90 decibels (dBA), hearing conservation program required if exposure is over 85 dBA. If noise is at or above 90 dBA you should wear ear muffs or ear plugs.

FIRST AID
IF IN EYES: Metal particles should be removed by trained individuals such as a nurse or physician.
IF ON SKIN: N/A
IF BREATHED: (Fumes from welding): Move to fresh air.
IF SWALLOWED: N/A

N/E means none established. N/A means not applicable.
N/D means no data available.

SECTION VII - REACTIVITY DATA.

HAZARDOUS POLYMERIZATION: Will not occur

STABILITY: Stable.

INCOMPATIBILITY: Iron may cause violent decomposition of hydrogen peroxide (52% by weight or greater).

SECTION VIII - SPILL OR LEAK PROCEDURES.
-----STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED:

If damaged, return castings to vendor or send to scrap reclaimer.

Collected dust from machining, welding, etc. may be classed as a "hazardous waste" depending on circumstances. Consult local authorities regarding disposal.

SECTION IX - PROTECTIVE EQUIPMENT TO BE USED.

RESPIRATORY PROTECTION: Wear a NIOSH approved respirator for dusts or fume if concentrations exceed the TLV or PEL.

VENTILATION: Provide general ventilation and/or local exhaust if necessary to maintain concentrations below the TLVs.

PROTECTIVE GLOVES: Work gloves advisable for handling castings.

EYE PROTECTION: Safety glasses with side shields and/or face shields for particles (grinding). Welding goggles or helmet for welding.

OTHER PROTECTIVE EQUIPMENT: Wear a protective apron and gauntlets if arc-air gouging or cutting, or welding on castings.

If noise is at or above 90 dBA you should wear ear muffs or ear plugs.

=====

N/E means none established. N/A means not applicable.
N/D means no data available.

SECTION X - SPECIAL PRECAUTIONS OR OTHER COMMENTS.

STORAGE: Keep dry to reduce rusting.

THE INFORMATION HEREIN IS BASED ON THE VENDOR'S MSDS WITH ADDITIONS AS NECESSARY TO COMPLY WITH CURRENT REGULATIONS. THE INFORMATION IS BELIEVED TO BE ACCURATE BUT UNDER THE CIRCUMSTANCES IS NOT WARRANTED TO BE.

=====

N/E means none established. N/A means not applicable.
N/D means no data available.

PRODUCT NAME DUCTILE IRON CONTRA NO. S <u>SC-000-042</u> REFER TO MATERIAL SAFETY DATA SHEET FOR MORE INFORMATION	MANUFACTURER EUREKA FOUNDRY COMPANY P.O. BOX 6039 (1601 CARTER ST.) CHATTANOOGA, TN 37401 Phone No. 615/267-3328 Fax No. 615/756-2607
--	---

FIRE HAZARD

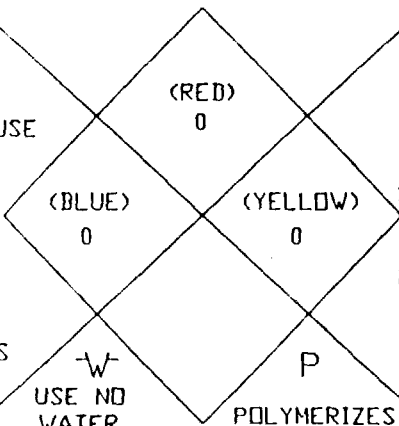
4. EXTREMELY DANGEROUS FIRE AND EXPLOSION HAZARD
3. FIRE AND EXPLOSION HAZARD AT NORMAL TEMP
2. WILL BURN AT TEMPS ABOVE 100 F
1. WILL BURN AT TEMPS ABOVE 200 F
0. WILL NOT BURN

HEALTH HAZARD

1. EXTREME HAZARD - AVOID CONTACT OR BREATHING VAPOR
3. SEVERE HAZARD - USE SPECIAL CLOTHING AND MASKS
2. HAZARDOUS - USE MASKS OR SPECIAL VENTILATION
1. SLIGHTLY HAZARDOUS - IRRITATING
0. NORMAL MATERIAL

REACTIVITY HAZARD

4. EXTREME HAZARD - VACATE AREA IN CASE OF FIRE
3. SEVERE EXPLOSION HAZARD
2. VIOLENT CHEMICAL CHANGE POSSIBLE
1. UNSTABLE IF HEATED
0. NORMALLY STABLE



W
USE NO
WATER

CAUTION: GRINDING, WELDING, OR ARC GOUGING
 THIS CASTING CREATES DUST OR FUMES CONTAINING
 SUBSTANCES LISTED BELOW WITH CORRESPONDING POSSIBLE
 HEALTH EFFECTS ON PROLONGED OR REPEATED OVEREXPOSURE:
 CHROMIUM (HEXAVALENT) LUNG CANCER -- NICKEL LUNG AND NASAL CANCER

THIS CASTING ALSO CONTAINS OR MAY CONTAIN CARBON, IRON, MANGANESE, AND SILICON.
 WEAR EYE PROTECTION. WEAR APPROVED DUST AND FUME RESPIRATOR IF EXPOSURES EXCEED
 SAFE LIMITS.

INGREDIENTS

CARBON
 CHROMIUM
 IRON
 MANGANESE
 NICKEL
 SILICON

STORAGE AND HANDLING

NO SPECIAL PRECAUTIONS

MATERIAL SAFETY DATA SHEET (MSDS)
 SC-000-041 REV. 3 DATE 05/11/88 CODE 24-4
 CONFORMS TO REQUIREMENTS OF OSHA STANDARD 1910.1200
 "HAZARD COMMUNICATION" AND TO VARIOUS STATE
 "EMPLOYEE RIGHT TO KNOW" LAWS
 COPYRIGHT 1988 AMERICAN FOUNDRYMEN'S SOCIETY

SECTION I PRODUCT IDENTIFICATION

This MSDS supplied for: GRAY IRON CASTING (2)

ASTM ALLOY DESIGNATION

VENDOR NAME AND ADDRESS: EUREKA FOUNDRY COMPANY (1)
 P.O. BOX 6039
 1601 CARTER ST.
 EMERGENCY PHONE NUMBER: CHATTANOOGA, TN 37401
 615/267-3328

FIRE HAZARD CLASS: HEALTH:0 FIRE: 0 REACTIVITY:0
 THE 4TH DIAMOND:

ANSI: CAUTION! FUMES OR DUST FROM THIS CASTING MAY CAUSE
 PIGMENTATION OF THE LUNG. NICKEL COMPOUNDS AND HEXAVALENT
 INSOLUBLE CHROMIUM HAVE BEEN FOUND TO BE CARCINOGENS IN LABORATORY
 ANIMALS.

SECTION II - HAZARDOUS COMPONENTS

INGREDIENT	CAS NO.	PERCENT	TLV	PEL
Carbon	7440-44-0	2.5-4.0	N/E	N/E
Silicon	7440-21-3	1.0-3.5	10 mg/cu.m	15 mg/cu.m
Manganese*	7439-96-5	0.2-1.1	C5 mg/cu.m as dust 1 mg/cu.m as fume	C5 mg/cu.m as dust
Nickel*	7440-02-0	0.01-1.5	1 mg/cu.m	1 mg/cu.m
Chromium*	7440-47-3	0.01-0.9	.5 mg/cu.m	1 mg/cu.m
Chromium (hexavalent)			.05 mg/cu.m	N/E
Molybdenum	7439-98-7	0.01-0.75	10 mg/cu.m	15 mg/cu.m
Sulfur	7704-34-9	0.02-0.18	N/E	N/E
Phosphorus	7723-14-0	0.01-0.8	.1 mg/cu.m	.1 mg/cu.m
Aluminum**	7429-90-5	0.01-0.05	10 mg/cu.m	N/E
Titanium	7440-32-6	0.01-0.06	N/E	N/E
Copper*	7440-50-8	0.01-0.90	.2 mg/cu.m as fume 1 mg/cu.m as dust	.1 mg/cu.m as fume 1 mg/cu.m as dust
Iron	7439-89-6	86.3-96.2	5 mg/cu.m as fume	10 mg/cu.m as fume

N/E means none established. N/A means not applicable.
 N/D means no data available.

Water insoluble hexavalent chromium is classified as a human carcinogen by the American Conference of Governmental Industrial Hygienists (ACGIH). Approximately 66% of the total chromium (in welding fume) is hexavalent, and only 5% of that is insoluble. Considering the small amount of chromium in the casting, overexposure to hexavalent chromium is not likely. (There is no hexavalent chromium in the alloy or its dust).

*This constituent, a toxic chemical, makes this product subject to the reporting requirements of section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372. Quantity thresholds for this chemical, below which reporting of releases is not required, are 50,000 pounds for 1988, and 25,000 pounds for 1989 and subsequent years. Chemicals marked **are reportable only if in the form of dust or fume.

SECTION III - OVERVIEW

There are no chemical hazards from these castings in solid form.

Dust or fumes generated, by machining, grinding, or welding on the casting will put contaminants in the air. Since the casting is over 85% iron, most of the dust or fume will be iron or iron oxide. There is no TLV for iron dust, but available information indicates that a concentration of 10 mg/cu.m., as if it were a nuisance dust, will serve as a guideline until a TLV is established.

High production dry machining of gray iron castings usually requires local exhaust ventilation.

Flame cutting, arc gouging, or welding on the casting generates iron oxide fume. Inhalation of too much iron oxide fume over a long time can cause siderosis, sometimes called "iron pigmentation" of the lung. It can be seen on a chest x-ray but causes little or no disability. Also see the Material Safety Data Sheet for the welding rod being used.

Welding or flame cutting may convert a fraction of the chromium to the water insoluble hexavalent (carcinogenic) form, but the chromium content of the casting is so low that over-exposure is not likely.

Nickel has been shown to cause cancer in laboratory animals. However its potential to cause cancer in humans has not been determined. The nickel content of the casting is so low that over-exposure is not likely.

N/E means none established. N/A means not applicable.
 N/D means no data available.

CERRO COATED PRODUCTS COMPANY
 MSDS NUMBER: 000-041-02-12

ENVIRONMENTAL HEALTH
 SAFETY

Grinding on castings that have not been cleaned or that contain embedded sand will generate significant amounts of dust containing free silica, which can cause silicosis. Good local ventilation is frequently required to prevent over-exposure in this situation. If good ventilation is not available, use a NIOSH-approved dust respirator.

Other toxic metals in the alloy are present in small amounts that will not represent a hazard if iron dust and fume are adequately controlled.

SECTION IV - PHYSICAL DATA

PHYSICAL DESCRIPTION: Solid, silver gray in color, no odor

BOILING POINT: 2750 C for iron

VAPOR PRESSURE: N/A

VAPOR DENSITY: N/A

SOLUBILITY IN WATER: N/A

SPECIFIC GRAVITY: 7.86 for iron

PERCENT VOLATILE BY VOLUME: N/A

EVAPORATION RATE: N/A

SECTION V - FIRE AND EXPLOSION DATA

Castings will not burn or explode.

SECTION VI - HEALTH HAZARD DATA.

EYES: Metal particles in the eyes may cause irritation if not removed.

SKIN: None known.

BREATHING: Prolonged or repeated overexposure to iron oxide produced in grinding or welding may cause siderosis.

SWALLOWING: N/A

NOISE: Grinding or machining castings is noisy. The OSHA limit for noise averaged over 8 hours is 90 decibels (dBA), hearing conservation program required if exposure is over 85 dBA. If noise is at or above 90 dBA you should wear ear muffs or ear plugs.

FIRST AID
IF IN EYES: Metal particles should be removed by trained individuals such as a nurse or physician.

IF ON SKIN: N/A

IF BREATHED: (Fumes from welding): Move to fresh air.

IF SWALLOWED: N/A

N/E means none established. N/A means not applicable.
N/D means no data available.

SECTION VII - REACTIVITY DATA.

HAZARDOUS POLYMERIZATION: Will not occur

STABILITY: Stable.

INCOMPATIBILITY: Iron may cause violent decomposition of hydrogen peroxide (52% by weight or greater).

SECTION VIII - SPILL OR LEAK PROCEDURES.

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED:

If damaged, return castings to vendor or send to scrap reclaimer.

Collected dust from machining, welding, etc. may be classed as a "hazardous waste" depending on circumstances. Consult local authorities regarding disposal.

SECTION IX - PROTECTIVE EQUIPMENT TO BE USED.

RESPIRATORY PROTECTION: Wear a NIOSH approved respirator for dusts or fume if concentrations exceed the TLV or PEL.

VENTILATION: Provide general ventilation and/or local exhaust if necessary to maintain concentrations below the TLVs.

PROTECTIVE GLOVES: Work gloves advisable for handling castings.

EYE PROTECTION: Safety glasses with side shields and/or face shields for particles (grinding). Welding goggles or helmet for welding.

OTHER PROTECTIVE EQUIPMENT: Wear a protective apron and gauntlets if arc-air gouging or cutting, or welding on castings.

If noise is at or above 90 dBA you should wear ear muffs or ear plugs.

SECTION X - SPECIAL PRECAUTIONS OR OTHER COMMENTS.

STORAGE: Keep dry to reduce rusting.

THE INFORMATION HEREIN IS BASED ON THE VENDOR'S MSDS WITH ADDITIONS AS NECESSARY TO COMPLY WITH CURRENT REGULATIONS. THE INFORMATION IS BELIEVED TO BE ACCURATE BUT UNDER THE CIRCUMSTANCES IS NOT WARRANTED TO BE.

N/E means none established. N/A means not applicable.
N/D means no data available.

PRODUCT NAME GRAY IRON Contra No S <u>SC-000-041</u> Refer to Material Safety Data Sheet for more information.		MANUFACTURER EUREKA FOUNDRY COMPANY P.O. BOX 6039 1601 CARTER STREET CHATTANOOGA, TN 37401 615/267-3328	
<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p style="text-align: center;">FIRE HAZARD</p> <p>4. EXTREMELY DANGEROUS FIRE AND EXPLOSION HAZARD</p> <p>3. FIRE AND EXPLOSION HAZARD AT NORMAL TEMP</p> <p>2. WILL BURN AT TEMPS ABOVE 100 F</p> <p>1. WILL BURN AT TEMPS ABOVE 200 F</p> <p>0. WILL NOT BURN</p> </div> <div style="width: 45%;"> <p style="text-align: center;">REACTIVITY HAZARD</p> <p>4. EXTREME HAZARD — VACATE AREA IN CASE OF FIRE</p> <p>3. SEVERE EXPLOSION HAZARD</p> <p>2. VIOLENT CHEMICAL CHANGE POSSIBLE</p> <p>1. UNSTABLE IF HEATED</p> <p>0. NORMALLY STABLE</p> </div> </div> <div style="display: flex; justify-content: space-between; margin-top: 20px;"> <div style="width: 45%;"> <p style="text-align: center;">HEALTH HAZARD</p> <p>4. EXTREME HAZARD — AVOID CONTACT OR BREATHING VAPOR</p> <p>3. SEVERE HAZARD — USE SPECIAL CLOTHING AND MASKS</p> <p>2. HAZARDOUS — USE MASKS OR SPECIAL VENTILATION</p> <p>1. SLIGHTLY HAZARDOUS — IRRITATING</p> <p>0. NORMAL MATERIAL</p> </div> <div style="width: 45%;"> <div style="text-align: center;"> <p>W USE NO WATER</p> <p>P POLYMERIZES</p> </div> <p style="text-align: center; font-size: small;">CAUTION! FUMES OR DUST FROM THIS CASTING MAY CAUSE PIGMENTATION OF THE LUNG. NICKEL COMPOUNDS AND HEXAVALENT INSOLUBLE CHROMIUM HAVE BEEN FOUND TO BE CARCINOGENS IN LABORATORY ANIMALS.</p> </div> </div>			
INGREDIENTS CARBON SILICON MANGANESE SULFUR PHOSPHORUS COPPER CHROMIUM METAL NICKEL ALUMINUM MOLYBDENUM		STORAGE AND HANDLING NO SPECIAL PRECAUTIONS	

MATERIAL SAFETY DATA SHEET (MSDS)
SC-000-043 REV. 3 DATE 05/11/88 CODE 24-4
CONFORMS TO REQUIREMENTS OF OSHA STANDARD 1910.1200
"HAZARD COMMUNICATION" AND TO VARIOUS STATE
"EMPLOYEE RIGHT TO KNOW" LAWS
COPYRIGHT 1988 AMERICAN FOUNDRYMEN'S SOCIETY

SECTION I PRODUCT IDENTIFICATION

This MSDS supplied for: ABRASION RESISTANT CAST IRON (2)

ASTM ALLOY DESIGNATION

VENDOR NAME AND ADDRESS: EUREKA FOUNDRY COMPANY (1)
P.O. BOX 6039
1601 CARTER STREET
CHATTANOOGA, TN 37401
EMERGENCY PHONE NUMBER: 615/267-3328

FIRE HAZARD CLASS: HEALTH:0 FIRE: 0 REACTIVITY:0

THE 4TH DIAMOND:

ANSI: WARNING! FUMES OR DUST FROM THIS CASTING MAY CAUSE
PIGMENTATION OF THE LUNGS. NICKEL COMPOUNDS AND HEXAVALENT
INSOLUBLE CHROMIUM HAVE BEEN FOUND TO BE CARCINOGENS IN LABORATORY
ANIMALS.

SECTION II - HAZARDOUS COMPONENTS

INGREDIENT	CAS NO.	PERCENT	TLV	PEL
Carbon	7440-44-0	2.0-3.6	N/E	N/E
Silicon	7440-21-3	0.8-1.5	10 mg/cu.m	15 mg/cu.m
Manganese*	7439-96-5	0.5-1.5	C5 mg/cu.m as dust	C5 mg/cu.m as dust
Nickel*	7440-02-0	0.5-7.0	1 mg/cu.m as fume	1 mg/cu.m
Chromium*	7440-47-3	1.1-28.0	1 mg/cu.m	1 mg/cu.m
Chromium (hexavalent)			.5 mg/cu.m	.05 mg/cu.m
Molybdenum	7439-98-7	0.5-3.5	10 mg/cu.m	15 mg/cu.m
Sulfur	7704-34-9	0.06-0.15	N/E	N/E
Phosphorus	7723-14-0	0.1-0.3	.1 mg/cu.m	.1 mg/cu.m
Copper*	7440-50-8	<1.2	.2 mg/cu.m as fume	.1 mg/cu.m as fume
Iron	7439-89-6	Remainder	1 mg/cu.m as dust 5 mg/cu.m as fume	1 mg/cu.m as dust 10 mg/cu.m as fume

N/E means none established.

N/A means not applicable.

N/D means no data available.

*CM MEANS CEILING LIMIT- these are limits which should not be
exceeded, even for a short time.

Water insoluble hexavalent chromium is classified as a suspect
human carcinogen by the American Conference of Governmental
Industrial Hygienists (ACGIH).

Certain forms of Nickel have been shown to cause cancer in
laboratory animals. However, its potential to cause cancer in
humans has not been determined.

*This constituent, a toxic chemical, makes this product
subject to the reporting requirements of section 313 of Title
III of the Superfund Amendments and Reauthorization Act of
1986 and 40 CFR Part 372. Quantity thresholds for this
chemical, below which reporting of releases is not required,
are 50,000 pounds for 1988, and 25,000 pounds for 1989 and
subsequent years. Chemicals marked **are reportable only if
in the form of dust or fume.

SECTION III - OVERVIEW

There are no chemical hazards from these castings in solid form.

Dust or fumes generated by machining, grinding, or welding on the
casting will put contaminants, primarily iron and chromium, in the
air. There is no TLV for iron dust, but available information
indicates that a concentration of 10 mg/cu.m., as if it were a
nuisance dust, will serve as a guideline until a TLV is
established.

Overexposure to iron oxide fume over a long time can cause
siderosis, sometimes called "iron pigmentation" of the lung. It
can be seen on a chest x-ray but causes little or no disability.
Also see the Material Safety Data Sheet for the welding rod being
used.

Since these castings contain up to 28 percent chromium, airborne
contaminants from machining or welding will contain chromium dust
or fume. If total welding fume is adequately controlled, chromium
will also be controlled.

N/E means none established.

N/A means not applicable.

N/D means no data available.

CERRD COPPER PRODUCTS COMPANY
MSDS NUMBER - CCRD-01-0271

APPROVAL:
ENVIRONMENTAL HEALTH & SAFETY:
SAFETY:
PURCHASING:

Welding or flame cutting may convert a small fraction of the chromium to the water insoluble hexavalent (carcinogenic) form. Approximately 66% of the total chromium (in welding fume) is hexavalent, and only 5% of that is insoluble. Chromium may also cause nose and skin irritation. In some sensitive people, an allergic skin reaction may develop. Use good personal hygiene and ventilation to keep concentrations below the TLV.

High production machining, grinding, welding operations, etc, frequently requires local exhaust ventilation. If ventilation is not adequate, wear a NIOSH approved dust and fume respirator.

Grinding on castings that have not been cleaned or that contain embedded sand will generate significant amounts of dust containing free silica, which can cause silicosis. Good local ventilation is frequently required to prevent over-exposure in this situation. If good ventilation is not available, use a NIOSH-approved dust respirator.

Other toxic metals in the alloy are present in small amounts that will not represent a hazard if chromium and iron dust and fume are adequately controlled.

SECTION IV - PHYSICAL DATA

PHYSICAL DESCRIPTION: Solid, silver gray in color, no odor
BOILING POINT: 2750 C for iron
VAPOR PRESSURE: N/A
VAPOR DENSITY: N/A
SOLUBILITY IN WATER: N/A
SPECIFIC GRAVITY: 7.86 for iron
PERCENT VOLATILE BY VOLUME: N/A
EVAPORATION RATE: N/A

SECTION V - FIRE AND EXPLOSION DATA

Castings will not burn or explode.

SECTION VI - HEALTH HAZARD DATA.

EYES: Metal particles in the eyes may cause irritation if not removed.
SKIN: Dust or fumes may cause irritation. In some sensitive people, allergic dermatitis may develop.

N/E means none established. N/A means not applicable.
N/D means no data available.

BREATHING: Prolonged or repeated overexposure to iron oxide produced in grinding or welding may cause siderosis. Overexposure to chromium fumes may cause nose irritation. Repeated inhalation, especially when combined with inadequate personal hygiene, may result in a perforated nasal septum. Breathing excessive amounts of silica dust for a long time can cause silicosis. Silicosis causes shortness of breath, reduced capacity to do work, and weakens the defenses against other lung diseases.

NOISE: Grinding castings is noisy. The OSHA limit for noise averaged over 8 hours is 90 decibels (dBA), hearing conservation program required if exposure is over 85 dBA. If noise is at or above 90 dBA you should wear ear muffs or ear plugs.

----- FIRST AID -----
IF IN EYES: Metal particles should be removed by trained individuals such as a nurse or physician.
IF ON SKIN: N/A
IF BREATHED: (Fumes from welding): Move to fresh air.
IF SWALLOWED: N/A

SECTION VII - REACTIVITY DATA.

HAZARDOUS POLYMERIZATION: Will not occur
STABILITY: Stable.
INCOMPATIBILITY: Iron may cause violent decomposition of hydrogen peroxide (52% by weight or greater). The dust may burn or explode when in contact with ammonium nitrate.

SECTION VIII - SPILL OR LEAK PROCEDURES.

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED:

If damaged, return castings to vendor or send to scrap reclaimer.

Collected dust from machining, welding, etc. may be classed as a "hazardous waste" depending on circumstances. Consult local authorities regarding disposal.

SECTION IX - PROTECTIVE EQUIPMENT TO BE USED.

RESPIRATORY PROTECTION: Wear a NIOSH approved respirator for dusts or fume if concentrations exceed the TLV or PEL.
VENTILATION: Provide general ventilation and/or local exhaust if necessary to maintain concentrations below the TLVs.

N/E means none established. N/A means not applicable.
N/D means no data available.

PROTECTIVE GLOVES: Work gloves advisable for handling castings.

EYE PROTECTION: Safety glasses with side shields and/or face shields for particles (grinding). Welding goggles or helmet for welding.

OTHER PROTECTIVE EQUIPMENT: Wear a protective apron and gauntlets if arc-air gouging or cutting, or welding on castings. If noise is at or above 90 dBA you should wear ear muffs or ear plugs.

SECTION X - SPECIAL PRECAUTIONS OR OTHER COMMENTS.

STORAGE: Keep dry to reduce rusting.

THE INFORMATION HEREIN IS BASED ON THE VENDOR'S MSDS WITH ADDITIONS AS NECESSARY TO COMPLY WITH CURRENT REGULATIONS. THE INFORMATION IS BELIEVED TO BE ACCURATE BUT UNDER THE CIRCUMSTANCES IS NOT WARRANTED TO BE.

N/E means none established. N/A means not applicable.
N/D means no data available.

PRODUCT NAME ABRASION RESISTANT CAST IRON Comira No. S <u>SC-000-043</u> Refer to Material Safety Data Sheet for more information.		MANUFACTURER EUREKA FOUNDRY COMPANY P.O. BOX 6039 1601 CARTER STREET CHATTANOOGA, TN 37401 615/267-3328	
HEALTH HAZARD 4. EXTREME HAZARD — AVOID CONTACT OR BREATHING VAPOR 3. SEVERE HAZARD — USE SPECIAL CLOTHING AND MASKS 2. HAZARDOUS — USE MASKS OR SPECIAL VENTILATION 1. SLIGHTLY HAZARDOUS — IRRITATING 0. NORMAL MATERIAL		REACTIVITY HAZARD 4. EXTREME HAZARD — VACATE AREA IN CASE OF FIRE 3. SEVERE EXPLOSION HAZARD 2. VIOLENT CHEMICAL CHANGE POSSIBLE 1. UNSTABLE IF HEATED 0. NORMALLY STABLE	
FIRE HAZARD 4. EXTREMELY DANGEROUS FIRE AND EXPLOSION HAZARD 3. FIRE AND EXPLOSION HAZARD AT NORMAL TEMP 2. WILL BURN AT TEMPS ABOVE 100 F 1. WILL BURN AT TEMPS ABOVE 200 F 0. WILL NOT BURN		STORAGE AND HANDLING NO SPECIAL PRECAUTIONS	
INGREDIENTS CARBON MANGANESE SILICON NICKEL CHROMIUM METAL MOLYBDENUM COPPER PHOSPHORUS SULFUR IRON		WARNING! FUMES OR DUST FROM THIS CASTING MAY CAUSE PIGMENTATION OF THE LUNGS. NICKEL COMPOUNDS AND HEXAVALENT INSOLUBLE CHROMIUM HAVE BEEN FOUND TO BE CARCINOGENS IN LABORATORY ANIMALS. W USE NO WATER P POLYMERIZES	

U.S. DEPARTMENT OF LABOR
Occupational Safety and Health AdministrationForm Approved
OMB No. 44-81117

MATERIAL SAFETY DATA SHEET

OSHA 309 (Rev. 1-77)

ENVIRONMENTAL
HEALTH
SAFETY
ADMINISTRATION
WASHINGTON, D.C. 20540

SECTION I

MANUFACTURER'S NAME

A. FINKL & SONS CO

EMERGENCY TELEPHONE NO.

(312) 975-2510

ADDRESS (Number, Street, City, State, and ZIP Code)

2011 N. Southport Ave. Chicago, IL 60614

CHEMICAL NAME AND SYNONYMS

Label steel forgings

TRADE NAME AND SYNONYMS

Steel Products

CHEMICAL FAMILY

NA

FORMULA

NA

SECTION II - HAZARDOUS INGREDIENTS

PAINTS, PRESERVATIVES, & SOLVENTS	%	TLV (Unit)	ALLOYS AND METALLIC COATINGS	%	TLV (Unit)
XXXXXXXXX See attached			BASE METAL		
XXXXXXXXX			ALLOYS		
XXXXXXXXX			METALLIC COATINGS		
XXXXXXXXX			FILLER METAL PLUS COATING OR CORE FLUX		
XXXXXXXXX			OTHERS		
XXXXXXXXX					
HAZARDOUS MIXTURES OF OTHER LIQUIDS, SOLIDS, OR GASES				%	TLV (Unit)
NA					

SECTION III - PHYSICAL DATA

BOILING POINT (°F.)	NA	SPECIFIC GRAVITY (H ₂ O=1)	NA
VAPOR PRESSURE (mm Hg.)	NA	PERCENT VOLATILE BY VOLUME (%)	NA
VAPOR DENSITY (AIR=1)	NA	EVAPORATION RATE (Ether = 1)	NA
SOLUBILITY IN WATER	NA		
APPEARANCE AND ODOR	Solid with metallic odor		

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (Method used)	NA	FLAMMABLE LIMITS	NA	Exp. Pt.
EXTINGUISHING MEDIA	NA			
SPECIAL FIRE FIGHTING PROCEDURES	NA			
UNUSUAL FIRE AND EXPLOSION HAZARDS	NA			

SECTION V - HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE: For inhalation of welding fumes - 5mg/M3 (8hr TWA)

EFFECTS OF OVEREXPOSURE: excessive exposure to metal fumes and vapors emitted when welding, burning or grinding may cause dizziness or nausea

EMERGENCY AND FIRST AID PROCEDURES:
Remove the afflicted employee to fresh air and seek medical aid immediately

SECTION VI - REACTIVITY DATA

STABILITY	UNSTABLE		CONDITIONS TO AVOID
	STABLE	X	NA

INCOMPATIBILITY (Materials to avoid)

HAZARDOUS DECOMPOSITION PRODUCTS: metal fumes and noxious gases may be produced during welding, burning and grinding operation.

HAZARDOUS POLYMERIZATION	MAY OCCUR		CONDITIONS TO AVOID
	WILL NOT OCCUR	X	

SECTION VII - SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

NA

WASTE DISPOSAL METHOD

NA

SECTION VIII - SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION: Specify type: NIOSH approved fume respirator when welding, burning or grinding.

VENTILATION	LOCAL EXHAUST recommended when welding, burning or grinding	SPECIAL
	MECHANICAL (General) should be sufficient to keep fumes below 5MG/M3	OTHER

PROTECTIVE GLOVES: welder's protective gloves

EYE PROTECTION: face shield or goggles

OTHER PROTECTIVE EQUIPMENT:

SECTION IX - SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING

See American National Standard Safety in Welding and Cutting 2491-1967

OTHER PRECAUTIONS

Section II - Hazardous Ingredients

All steel products are alloys which consist primarily of iron (generally >95%). However, other elements which are either added intentionally or present as contaminants or residuals may also occur in these products at trace or low concentrations (generally <5.0%). These elements may include the following:

	TLV's (mg/M)
Carbon	55 (as CO)
Manganese	5
Phosphorus	0.1
Sulfur	13 (as SO ₂)
Silicon	10
Nickel	1.0
Chromium	0.05
Molybdenum	5 (soluble compounds)
Vanadium	0.05 (fume)
Boron	10 (as boron oxide)
Aluminum	10 (as Al ₂ O ₃)
Calcium	5 (as CaO)
Oxygen	NA
Nitrogen	NA
Copper	0.2 (fume)
Titanium	10 (as titanium dioxide)
Zirconium	5
Niobium	NA
Zinc	5 (as ZnO fume)
Tin	10 (as tin oxide)
Cadmium	0.05 (as cadmium oxide fume)
Beryllium	0.002
Magnesium	10 (as magnesium oxide fume)
Tungsten	1.0 (soluble compounds)
Cobalt	0.05

Some of these elements may also comprise contaminant or residual compounds present in these products. In addition, an oil surface film is often added to steel products as a rust inhibitor.

Section VI. Health Hazard Data

Note: Steel products in the natural state do not present an inhalation, ingestion or contact hazard. However, operations such as burning, welding, sawing, brazing, and grinding may result in the possible effects shown in Health Hazard Data if exposure exceeds permissible limits as listed in Section II.

===== MATERIAL SAFETY DATA SHEET =====
===== For chemicals, coatings and resins =====
===== In compliance with OSHA 29 CFR 1910.1200 =====

DATE PREPARED:

1-3-87

===== Manufacturer =====

NAME : Belzona Molecular Metalife, Inc. (1)

ADDRESS: 100 Charles Lindbergh Blvd.

ADDRESS: Uniondale, L.I., NY

ADDRESS:

ZIPCODE: 11553

EMERGENCY PHONE NUMBER

DAY: (516)-542-1000

NIGHT: (516)-483-3100

INFORMATION PHONE NUMBER

(516)-542-1000

===== Section I - Product =====

NUMBER: 1004/0866/12/2

NAME : BELZONA MOLECULAR E-METAL BASE (2)

CLASS : MODIFIED EPOXY RESIN

H M I S Hazard Codes

Health: 2 Moderate

Flammability: 1 Slight

Reactivity: 1 Slight

Personal Protective Equipment: B

===== Section II - Hazardous Ingredients =====

Ingredient	Percent	C. A. S.	LEL	Vapor Pressure
Material Description	(by weight)	Registry No.		mm Hg @ 20 C

DGEBA-EPOXY RESIN

NIA

25068-38-6

NIA

0.01

DGEBF-EPOXY RESIN

NIA

28064-14-4

NIA

NIA

===== Section III - Physical Data =====

Boiling Range: NIA to NIA deg F

Freezing Point: NIA deg F

Vapor Pressure: <0.01 mm @ 20 deg C

Vapor Density: (Heavier than air)

Specific Gravity: 2.5

H2O Solubility: Negligible (< 0.1%)

Evaporation Rate: Slower

% Volatile by Volume: 0.0 %

(relative to n-butyl acetate)

Appearance and Odor: GREY THIXOTROPIC PASTE WITH NO ODOR.

===== Section IV - Fire and Explosion Hazard Data =====

Flash point: 424. deg F

Explosive Limits:

LEL

UEL (%V in air)

(Method Used) Setaflash

NIA

NIA

FLAMMABILITY CLASSIFICATION

OSHA: Combustible Liquid - Class IIIB

DOT : Not regulated

EXTINGUISHING MEDIA:

WATER FOG.

FOAM.

CARBON DIOXIDE.

DRY CHEMICAL.

SPECIAL FIRE FIGHTING PROCEDURES:

WEAR PROTECTIVE CLOTHING.

USE SELF CONTAINED BREATHING APPARATUS.

FULL BUNKER GEAR SHOULD BE WORN IN EXTREME CASES.

USE SAND TO CONTAIN BURNING MATERIAL.

RUN OFF FROM FIRE CONTROL MAY CAUSE POLLUTION.

DECONTAMINATE CLOTHING AFTER USE.

UNUSUAL FIRE AND EXPLOSION HAZARDS:

DECOMPOSITION AND COMBUSTION PRODUCTS MAY BE HAZARDOUS.

=====

Section V - Toxicological Information

=====

Material Description	OSHA 1 ACGIH	LD50(mg/kg)	LC50(ppm)
DGBA-EPOXY RESIN	NIA	NIA	NIA
DGEF-EPOXY RESIN	NIA	NIA	NIA

=====

Section VI - Health Hazard Data

=====

EFFECTS OF OVEREXPOSURE: THRESHOLD LIMIT VALUES: See Section V

=====

Section VII - Reactivity Data

=====

STABILITY: Stable

STABILITY CONDITIONS TO AVOID:

INCOMPATIBILITY (MATERIALS TO AVOID CONTACT WITH):

AVOID STRONG OXIDIZING AGENTS, AMINES.

AVOID EPOXY RESIN AND AMINE MIXTURES.

HAZARDOUS DECOMPOSITION PRODUCTS:

OXIDES OF CARBON.

ALDEHYDES.

HAZARDOUS POLYMERIZATION: Will not occur

POLYMERIZATION CONDITIONS TO AVOID:

AVOID STRONG ACIDS OR BASES IN BULK.

=====

Section VIII - Spill or Leak Procedures

=====

STEPS FOR MATERIAL SPILLAGE:

REMOVE ALL SOURCES OF IGNITION.

USE SAND TO ABSORB SPILLED MATERIAL AND DISPOSE OF PROPERLY.

KEEP OUT OF WATER SUPPLY.

TRANSFER TO CLOSED METAL CONTAINER.

WASTE DISPOSAL METHODS:

LANDFILL IN ACCORDANCE WITH LOCAL, STATE, AND FEDERAL REGULATIONS.

SOLIDIFY AND DISPOSE OF PROPERLY.

=====

Section IX - Special Protection Information

=====

RESPIRATORY PROTECTION:

USE NIOSH APPROVED RESPIRATOR SUITABLE FOR ORGANIC VAPORS IF NECESSARY

VENTILATION:

PROVIDE ADEQUATE CROSS AIR CIRCULATION.

PROTECTIVE GLOVES:

SYNTHETIC GLOVES.

EYE PROTECTION:

SAFETY GOGGLES.

OTHER PROTECTIVE EQUIPMENT:

EYEWASH STATION.

EMERGENCY SHOWER.

IMPERMEABLE APRON OR GARMENT TO MINIMIZE SKIN CONTACT.

CHEMICALS ARE NOT LISTED AS CARCINOGENS BY OSHA, NTP, ACGIH, OR IARC.

=====
===== Section X - Special Precautions =====
=====

HANDLING AND STORAGE PRECAUTIONS:

OVERHEATING MAY CAUSE CONTAINER TO RUPTURE.

MUST BE KEPT IN DRY, COOL AND COVERED AREA.

AVOID BREATHING VAPORS.

EMPTY CONTAINERS RETAIN RESIDUE AND MAY BE DANGEROUS.

DISCARD CONTAMINATED SHOES.

OTHER PRECAUTIONS:

CHECK ALL CONTAINERS FOR LEAKS.

AVOID PROLONGED BREATHING OR CONTACT WITH SKIN.

=====DISCLAIMER=====

EVERY EFFORT HAS BEEN MADE TO ENSURE THAT THE SAFETY INFORMATION IN THIS SHEET IS ACCURATE, SINCE BELZONA MOLECULAR METALIFE, INC. HAS NO CONTROL OVER THE CONDITIONS UNDER WHICH THE PRODUCT WILL BE USED, LIABILITY WILL NOT BE ASSUMED TO EXCEED REPLACEMENT OR REFUND OF THE PURCHASE PRICE OF THIS PRODUCT, EXCEPT AS STATED HEREIN, THERE ARE NO EXPRESS OR IMPLIED WARRANTIES INCLUDING IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. BELZONA MOLECULAR METALIFE, INC. ASSUMES NO LIABILITY FOR INJURY OR INCIDENTAL OR CONSEQUENTIAL DAMAGE ARISING OUT OF THE STORAGE, HANDLING OR USE OF THIS PRODUCT.

LETTER DESIGNATION OF PERSONAL PROTECTIVE EQUIPMENT

A - SAFETY GLASSES.	B - SAFETY GLASSES, GLOVES.
C - SG, G, SYNTHETIC APRON.	D - FACE SHIELD, G, SA.
E - SG, G, DUST RESPIRATOR.	F - SG, G, SA, DR.
G - SG, G, VAPOR RESPIRATOR.	H - VAPOR RESPIRATOR.
I - SG, G, COMBINATION D & VR.	J - COMB. D & VR.
K - AIRLINE HOOD, G, FULL PROTECTIVE SUIT, BOOTS.	
X - SPECIAL HANDLING PROCEDURE.	

Authorized Signature: _____

Date: _____

Title: _____

**Tribol**

MSDS NUMBER 170W-00-0173
REVISION 1
ENVIRONMENTAL
Hazardous
Information

MATERIAL SAFETY DATA SHEET

SECTION 1 - PRODUCT IDENTIFICATION AND USE

PRODUCT IDENTIFIER:

Molub-Alloy 170W Gear Oil ISO 680

PRODUCT ID NO.:

See SECTION 9

CHEMICAL NAME:

Petroleum hydrocarbons plus performance additives.

SYNONYMS:

Not Applicable. Product is a mixture.

CHEMICAL FORMULA:

Not Applicable. No single formula.

CHEMICAL FAMILY:

Petroleum hydrocarbons plus performance additives.

PRODUCT USE:

Lubricant.

PRODUCT CAS NO.:

Not Applicable. No single CAS number.

NFPA CLASSIFICATION:**HEALTH: 1 FIRE: 1 REACTIVITY: 0****SPECIAL HAZARDS:** None known.**MANUFACTURER:**Tribol
4801 W. 147th St.
Hawthorne, CA 90250-6795
U.S.A.
Emergency Phone: (213) 679-0271**SUPPLIER (CANADA):**Tribol Inc.
409 King Street West, Suite 404
Toronto, Ontario
Canada M5V 1K1
Emergency Phone: (213) 679-0271**TRANSPORTATION EMERGENCY:**In U.S.A.: CHEMTREC - (800) 424-9300
In District of Columbia - (202) 483-7616
In Canada: CANUTEC - (613) 966-6666 (Call Collect)

SECTION 2 - HAZARDOUS INGREDIENTS

	%	CAS NO	LD ₅₀	LC ₅₀	Exposure Limits (TWA*)
Solvent-dewaxed petroleum raffinates.	84-94	64742-62-7	>5g/kg Acute oral (Rats)	Not found	5mg/m ³ for mist (OSHA & ACGIH)
Sulfurized vegetable oil	3-7	68990-64-7	Not found	Not found	5mg/m ³ for mist (Tribol's recommendation)

*TWA = 8-hour time-weighted average.

Note: Exposure limits may vary between jurisdictions. Employers are advised to contact regulatory agencies for the limits in effect in their areas.

SECTION 3 - PHYSICAL DATA

PHYSICAL STATE:	Liquid.
APPEARANCE AND ODOR:	Dark grey liquid. Slight characteristic odor.
ODOR THRESHOLD (ppm):	Not determined.
VAPOR PRESSURE (mm Hg):	Not determined.
VAPOR DENSITY (Air=1):	Not determined for this product. For base oil: >1
EVAPORATION RATE (n-Butyl acetate = 1):	Not determined for this product. For base oil: <1
BOILING POINT (°C/°F):	Not determined.
POUR POINT (°C/°F):	+10 / -12
FREEZING POINT (°C/°F):	Not determined.
pH:	Not applicable.
SPECIFIC GRAVITY:	0.92 (typical)



PERCENT VOLATILE
(By weight):

Negligible.

SOLUBILITY IN WATER:

Negligible (less than 0.1%).

SECTION 4 - FIRE AND EXPLOSION HAZARD DATA

FLAMMABILITY:

This product is not classified as flammable or combustible; however, it will burn if its temperature reaches or exceeds its flash point.

EXTINGUISHING MEDIA:

Dry Chemical, water-fog, chemical foam, or CO₂. Direct water-stream may cause frothing.

SPECIAL FIREFIGHTING PROCEDURE:

Use water to cool fire-exposed containers. Wear full emergency equipment with supplied-air respirator (SA), or self-contained breathing apparatus (SCBA).

UNUSUAL FIRE & EXPLOSION HAZARDS:

None known.

FLASH POINT (°C/°F) AND METHOD:

254/490, ASTM D 92 (C.O.C.)

FIRE POINT (°C/°F) AND METHOD:

Not determined.

FLAMMABLE LIMITS (% by volume):

Upper: Not determined.
Lower: Not determined.

AUTOIGNITION TEMPERATURE (°C/°F):

Not determined.

HAZARDOUS COMBUSTION PRODUCTS:

Smoke and toxic gases including aldehydes, short-chain alkyl mercaptans, hydrogen sulfide (H₂S), and oxides of molybdenum, zinc, phosphorus, carbon, sulfur, and nitrogen.

EXPLOSION SENSITIVITY:

Impact:

Static Discharge:

☐ Sensitive ☒ Not Sensitive
☐ Sensitive ☒ Not Sensitive

EMPTY/PARTIAL CONTAINER WARNING:

As with most petroleum products, empty or partial containers may contain explosive vapors. Do not expose to direct flame or high temperature.

SECTION 5 - REACTIVITY DATA

CHEMICAL STABILITY:

Conditions to Avoid:

☒ Stable ☐ Unstable
Prolonged exposure to elevated temperature.

INCOMPATIBILITY:
Materials to Avoid:

 X Yes No
Strong oxidizers, acids, and alkalies.

HAZARDOUS POLYMERIZATION:
Conditions to Avoid:

 Will Occur X Will Not Occur
None.

HAZARDOUS DECOMPOSITION PRODUCTS: Smoke and toxic gases including aldehydes, short-chain alkyl mercaptans, hydrogen sulfide (H₂S), and oxides of molybdenum, zinc, phosphorus, carbon, sulfur, and nitrogen.

SECTION 6 - TOXICOLOGICAL PROPERTIES & HEALTH HAZARD DATA

ROUTES OF ENTRY:

 X Skin Contact Skin Absorption
 X Eye Contact X Inhalation
 X Ingestion

SYMPTOMS AND EFFECTS OF ACUTE EXPOSURE:

Skin: May cause skin irritation.

Eyes: Product, vapors, and mist may cause eye irritation and burning.

Inhalation: Vapors may irritate the mucosal membranes of mouth, nose, and throat. Intense and/or prolonged exposure to vapor concentrations exceeding the TLV/PEL may cause headache, nausea, and vomiting. Oil vapors may accumulate in the lungs, and may cause chemical pneumonitis.

Ingestion: Ingestion via minor contamination of fingers or food is not likely to cause significant discomfort or adverse effect. However, aspiration (with vomitus) into the lungs may cause mild to severe pulmonary injury, and may be fatal.

SYMPTOMS AND EFFECTS OF CHRONIC EXPOSURE:

Skin: Prolonged or repeated contact tends to remove natural skin oil, and may cause irritation, rash, and possibly dermatitis.

Eyes: Product, vapors, and mist may cause eye irritation and burning.

Inhalation: Chronic inhalation may produce the same symptoms and effects discussed under Inhalation - ACUTE EXPOSURE, above.

Ingestion: In the normal course of industrial use, ingestion of large quantities of this product is unlikely. Nevertheless, ingestion may irritate the gastro-intestinal tract and may cause nausea and vomiting. Aspiration (with vomitus) into the lungs may cause pulmonary injury and may be fatal.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: Existing chronic dermal, respiratory, and possibly gastrointestinal diseases.

EXPOSURE LIMITS: Not determined for this product. See Section 2 - HAZARDOUS INGREDIENTS, in this MSDS, for ingredient(s) limits.

IRRITANCY: Possible irritancy of skin, eyes, mucosal membranes, and respiratory tract.



SENSITIZATION: None known.

CARCINOGENICITY: NTP Listed: ☐ Yes ☒ No
IARC Listed: ☐ Yes ☒ No
OSHA Listed: ☐ Yes ☒ No

TERATOGENICITY AND EMBRYOTOXICITY: This product is not known to contain, at 0.1% or higher, any ingredients known to cause teratogenic or embryonic toxicity.

REPRODUCTIVE TOXICITY: This product is not known to contain, at 0.1% or higher, any ingredients known to cause reproductive toxicity.

MUTAGENICITY: This product is not known to contain, at 0.1% or higher, any ingredients known to cause mutation in the living cell.

SYNERGISTIC PRODUCTS: None known.

SECTION 7 - PREVENTIVE MEASURES AND PERSONAL PROTECTION

It is unlikely that serious overexposure to this product will occur during normal industrial use. Nevertheless, the user must exercise adequate precautions to protect against accidental spills, and to avoid undue exposure to sprays, mists, or vapors that may be inadvertently generated, especially at elevated temperatures. The following protective measures are recommended whenever undue exposure is unavoidable.

GLOVES: Oil-impervious and solvent-resistant (e.g. neoprene) type.

RESPIRATOR: OSHA/NIOSH-approved supplied-air respirator (SA), or self-contained breathing apparatus (SCBA).

EYE PROTECTION: Chemical goggles or, preferably, full face-shield. Do not wear contact lenses in the work area.

FOOTWEAR: Oil-impervious (e.g. neoprene) cover and anti-slip sole construction.

CLOTHING: Oil-impervious (e.g., neoprene) apron or, preferably, coveralls.

OTHER PROTECTION: As deemed necessary.

PERSONAL HYGIENE: Wash hands before eating or smoking. Do not smoke in the work area. Promptly remove contaminated clothing. Immediately clean up any spills, to prevent accidental slipping.

ENGINEERING CONTROLS: General ventilation, normally adequate, should be augmented with local exhaust whenever the TLV/PEL is exceeded, or worker discomfort is reported or observed.

LEAK AND SPILL PROCEDURE: Wear adequate protection and eliminate all sources of ignition. Stop the leak, if it can be safely done. Ventilate the area and dike the spill to prevent entry into sewer or watercourses. Suction or scoop the spill into appropriate disposal or recycling vessels, then cover the spill area with oil-absorbent. Label all waste containers appropriately, including all applicable hazard symbols. If spill enters U.S. navigable waters, the contiguous zone, or adjoining shorelines, notify the Coast Guard National Response Center (Tel. No. 800-424-8802).

WASTE DISPOSAL: Dispose of waste in accordance with applicable Federal, State (or Province), and local laws and regulations. (The services of licensed hazardous waste-disposal facilities may be utilized.) It is the user's responsibility to comply with the U.S. Clean Air Act, Clean Water Act, and Resource Conservation and Recovery Act. Refer to Section 10 - REGULATORY INFORMATION, in this MSDS.

HANDLING PROCEDURES & EQUIPMENT: Exercise prudent precautions to avoid accidental spillage, food contamination, vapor or mist inhalation, eye or skin contact, and ignition of this product.

STORAGE REQUIREMENTS: Store in a clean, dry area below 49°C/120°F, away from all ignition sources and incompatible materials listed in SECTION 5 - REACTIVITY DATA, in this MSDS.

SPECIAL SHIPPING INFORMATION: See Sections 9 & 10, in this MSDS.

SECTION 8 - FIRST AID AND EMERGENCY MEASURES

SKIN: Wipe off, then wash thoroughly with soap and water.

EYES: Flush immediately with water for at least 15 minutes, occasionally lifting the eyelid. Get prompt medical attention.

INHALATION: Immediately remove the individual to fresh air. If breathing is difficult, administer oxygen. If breathing stops, administer artificial respiration. Keep the individual warm and quiet, and get prompt medical attention.

INGESTION: If the individual is conscious, give 1-2 glasses of milk or water to dilute stomach content. Do not physically induce vomiting. Never give anything by mouth to an unconscious person. As with all accidental chemical ingestions, use all available precautions to prevent aspiration of vomitus into the lungs, which may be fatal. Position the patient's head so as to facilitate expulsion of vomitus. Get prompt medical attention.

NOTE TO PHYSICIAN: Intubate the stomach. Aspirate the pharynx as regularly as possible to remove gagged or vomited stomach content.

SECTION 9 - TRANSPORTATION INFORMATION

PRODUCT IDENTIFICATION:	Not applicable.		
DOT PROPER SHIPPING NAME:	Not applicable.		
DOT HAZARD CLASS:	Not applicable.		
DOT LABEL REQUIRED:	None.		
IMO CLASS:	Not applicable.		
CANADIAN (WHMIS) CLASSIFICATION:	Class: D	Division: 2	Subdivision: B
CANADIAN (TDG ACT) CLASSIFICATION:	Primary: Not applicable	Subsidiary: Not applicable	
PACKAGING (PACKING) GROUP:	Not applicable.		

**Tribol**

FREIGHT CLASSIFICATION:

Petroleum Lubricating Oil.

SECTION 10 - REGULATORY INFORMATION

TOXIC SUBSTANCE CONTROL ACT (TSCA): To our best knowledge, all the ingredients in this product have been included, by their manufactures/suppliers, on the TSCA Inventory.

SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT (SARA)

SECTION 302 - EXTREMELY HAZARDOUS SUBSTANCES: This product contains the following ingredient(s) on this list: None.

SECTION 313 - TOXIC CHEMICALS: This product contains the following ingredient(s) at or above the de minimis concentrations: None.

COMPREHENSIVE ENVIRONMENTAL RESPONSE, COMPENSATION, AND LIABILITY ACT (CERCLA):

Reporting of releases of this product is X required not required.
CERCLA statutory RQ = 250 lbs. (32 gallons), due to zinc compound content.

RESOURCE, CONSERVATION, AND RECOVERY ACT (RCRA): This product contains the following ingredient(s) on the Hazardous Wastes List: None.

CALIFORNIA HAZARDOUS SUBSTANCES LIST: This product contains the following ingredients at or above the de minimis concentrations: Oil at 94% (max.).

CALIFORNIA PROPOSITION 65: This product contains the following ingredient(s) listed in the Safe Drinking Water and Toxic Enforcement Act of 1986: None.

MICHIGAN CRITICAL MATERIALS: This product contains the following ingredient(s) at or above the de minimis concentrations: None.

CANADA'S WORKPLACE HAZARDOUS MATERIALS INFORMATION SYSTEM (WHMIS): This product contains the following substance(s) at or above the de minimis concentrations: None.

SECTION 11 - PREPARATION OF THE MSDS

PREPARED BY:	Nabil N. Saaty, Toxicologist
TELEPHONE NO.:	(213) 679-0271
DATE:	July 27, 1990
SUPERSEDES:	June 22, 1990

The information presented herein has been compiled from sources considered to be dependable, and is, to the best knowledge of Tribol, accurate at the time of this writing. The data in this MSDS relates only to the product(s) designated herein. Tribol makes no warranty whatsoever, expressed or implied, regarding the accuracy of this data or the results to be obtained from the use thereof. Tribol assumes no responsibility for injury to buyer or to third persons, or for any damage to property. Buyer assumes all risks.

**MATERIAL SAFETY DATA SHEET**CERRO COPPER PRODUCTS COMPANY
MSDS NUMBER - CCPC-00-0299

CERRO, INC.

CERRO COPPER PRODUCTS COMPANY
14701 W. 147TH ST.
HAWTHORNE, CA 90250-6795
U.S.A.
TELEPHONE (213) 679-0271
FAX (213) 679-0271**SECTION 1 - PRODUCT IDENTIFICATION AND USE****PRODUCT IDENTIFIER:**Molub-Alloy 860/150-0 Grease
Molub-Alloy 860/150-1 Grease
Molub-Alloy 860/150-2 Grease**PRODUCT ID NO.:**See SECTION 9
See SECTION 9
See SECTION 9**CHEMICAL NAME:**

Petroleum hydrocarbons plus performance additives.

SYNONYMS:

Not Applicable. Product is a mixture.

CHEMICAL FORMULA:

Not Applicable. No single formula.

CHEMICAL FAMILY:

Petroleum hydrocarbons plus performance additives.

PRODUCT USE:

Lubricant.

PRODUCT CAS NO.:

Not Applicable. No single CAS number.

NFPA CLASSIFICATION:**HEALTH: 1 FIRE: 1 REACTIVITY: 0**
SPECIAL HAZARDS: None known.**MANUFACTURER:**Tribol
4801 W. 147th St.
Hawthorne, CA 90250-6795
U.S.A.
Emergency Phone: (213) 679-0271**SUPPLIER (CANADA):**Tribol Inc.
409 King Street West, Suite 404
Toronto, Ontario
Canada M5V 1K1
Emergency Phone: (213) 679-0271**TRANSPORTATION EMERGENCY:**In U.S.A.: CHEMTREC - (800) 424-9300
In District of Columbia - (202) 483-7616
In Canada: CANUTEC - (613) 966-6666 (Call Collect)

SECTION 2 - HAZARDOUS INGREDIENTS

	%	CAS NO	LD ₅₀	LC ₅₀	Exposure Limits (TWA*)
Severely treated petroleum distillates and raffinates.	72-86	64741-96-4 64742-54-7 64742-65-0	>5g/kg Acute oral (Rats)	Not found	5mg/m ³ for mist (OSHA & ACGIH)
Molybdenum disulfide.	1-2	1317-33-5	15g/kg Acute oral (Rats)	Not found	15mg/m ³ (OSHA) 10mg/m ³ (ACGIH)
Organo-antimony compound	1-3	Trade secret**	16.4g/kg Acute oral (Rats)	Not found	0.5mg/m ³ as antimony (OSHA & ACGIH)

*TWA = 8-hour time-weighted average.

**Exact chemical identity is being withheld as a trade secret, but health and physical hazards are disclosed in this MSDS. Trade secret exemption application for Canada pending.

Note: Exposure limits may vary between jurisdictions. Employers are advised to contact regulatory agencies for the limits in effect in their areas.

SECTION 3 - PHYSICAL DATA

PHYSICAL STATE:	Viscous paste.
APPEARANCE AND ODOR:	Dark grey paste. Faint characteristic odor.
ODOR THRESHOLD (ppm):	Not determined.
VAPOR PRESSURE (mm Hg):	Not determined for this product. For base oil: <0.01, at 20°C/68°F.
VAPOR DENSITY (Air=1):	Not determined for this product. For base oil: >1
EVAPORATION RATE (Ether = 1):	Not determined for this product. For base oil: <1
BOILING POINT (°C/°F):	Not determined.



FREEZING POINT (°C/°F): Not determined.

pH: Not applicable.

SPECIFIC GRAVITY: 0.93 (typical)

**PERCENT VOLATILE
(By weight):** Negligible.

SOLUBILITY IN WATER: Negligible.

SECTION 4 - FIRE AND EXPLOSION HAZARD DATA

FLAMMABILITY: This product is not classified as flammable or combustible; however, it will burn if its temperature reaches or exceeds its flash point.

EXTINGUISHING MEDIA: Dry Chemical, water-fog, chemical foam, or CO₂. Direct water-stream may cause frothing.

SPECIAL FIREFIGHTING PROCEDURE: Use water to cool fire-exposed containers. Wear full emergency equipment with supplied-air respirator (SA), or self-contained breathing apparatus (SCBA).

UNUSUAL FIRE & EXPLOSION HAZARDS: None known.

FLASH POINT (°C/°F) AND METHOD: Not determined for this product.
For base fluid: 232/450, ASTM D 92 (C.O.C.)

FIRE POINT (°C/°F) AND METHOD: Not determined for this product.
For base fluid: 260/500, ASTM D 92 (C.O.C.)

FLAMMABLE LIMITS (% by volume): Upper: Not determined.
Lower: Not determined.

AUTOIGNITION TEMPERATURE (°C/°F): Not determined.

HAZARDOUS COMBUSTION PRODUCTS: Smoke and toxic gases including lithium oxide and hydroxide, oxides of antimony, molybdenum, carbon, sulfur, and nitrogen, and small amounts of aromatic and aliphatic hydrocarbons.

EXPLOSION SENSITIVITY:

Impact:	<input type="checkbox"/> Sensitive	<input checked="" type="checkbox"/> Not Sensitive
Static Discharge:	<input type="checkbox"/> Sensitive	<input checked="" type="checkbox"/> Not Sensitive

EMPTY/PARTIAL CONTAINER WARNING: As with most petroleum products, empty or partial containers may contain explosive vapors. Do not expose to direct flame or high temperature.

SECTION 5 - REACTIVITY DATA

CHEMICAL STABILITY:

Conditions to Avoid:

 X Stable Unstable
Prolonged exposure to elevated temperature.

INCOMPATIBILITY:

Materials to Avoid:

 X Yes No
Strong oxidizers, acids, and alkalies.

HAZARDOUS POLYMERIZATION:

Conditions to Avoid:

 Will Occur X Will Not Occur
None.

HAZARDOUS DECOMPOSITION PRODUCTS: Smoke and toxic gases including lithium oxide and hydroxide, oxides of antimony, molybdenum, carbon, sulfur, and nitrogen, and small amounts of aromatic and aliphatic hydrocarbons.

SECTION 6 - TOXICOLOGICAL PROPERTIES & HEALTH HAZARD DATA

ROUTES OF ENTRY:

 X Skin Contact X Skin Absorption
 X Eye Contact X Inhalation
 X Ingestion

SYMPTOMS AND EFFECTS OF ACUTE EXPOSURE:

Skin: May cause skin irritation.

Eyes: Product, vapors, and mist may cause eye irritation and burning.

Inhalation: Vapors may irritate the mucosal membranes of mouth, nose, and throat. Intense and/or prolonged exposure to vapor concentrations exceeding the TLV/PEL may cause headache, nausea, and vomiting. Oil vapors may accumulate in the lungs, and may cause chemical pneumonitis.

Ingestion: Ingestion via minor contamination of fingers or food is not likely to cause significant discomfort or adverse effect. However, aspiration (with vomitus) into the lungs may cause mild to severe pulmonary injury, and may be fatal.

STATEMENT ON SYSTEMIC TOXICITY

This product is a paste containing an organo-antimony ingredient, whereas the symptoms and effects detailed below resulted from inorganic antimony compounds dust-inhalation, or direct injection, neither of which is a practical entry route for this product. Furthermore, while no parallel studies on organo-antimony compounds are found, it is prudent to avoid undue exposure.

SYMPTOMS AND EFFECTS OF CHRONIC EXPOSURE:

- Skin:** Prolonged or repeated contact tends to remove natural skin oil, and may cause irritation, rash, and possibly dermatitis. Evidence suggests that antimony permeation of the skin can occur in amounts capable of producing the effects of systemic poisoning.
- Eyes:** Product, vapors, and mist may cause eye irritation. Antimony products can cause keratitis and conjunctivitis.
- Inhalation:** Chronic inhalation may produce the same symptoms and effects discussed under Inhalation - ACUTE EXPOSURE, above.
- Inhalation of high levels of antimony trisulfide dust has been reported to cause antimony poisoning characterized by muscular pain, anorexia, weight-loss, hair-loss, dry and scaly skin, blood and blood-pressure abnormalities, cardiac injury (T-wave changes), pneumonitis, and acute congestion of the heart, liver, and kidneys. Chronic antimony dust-inhalation has resulted in death from myocardial failure.
- Ingestion:** Injection of antimony trisulfide into the abdominal lining of laboratory animals produced acute antimony poisoning characterized by the same symptoms and effects detailed in the inhalation subheading, above.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: Existing chronic dermal, respiratory, and cardiovascular diseases.

EXPOSURE LIMITS: Not determined for this product. See SECTION 2 - HAZARDOUS INGREDIENTS, in this MSDS, for ingredient(s) limits.

IRRITANCY: Possible irritancy of skin, eyes, mucosal membranes, and respiratory tract.

SENSITIZATION: May cause skin and respiratory sensitization.

CARCINOGENICITY:

NTP Listed:	___	Yes	<u>X</u>	No
IARC Listed:	___	Yes	<u>X</u>	No
OSHA Listed:	___	Yes	<u>X</u>	No

TERATOGENICITY AND EMBRYOTOXICITY: Reports of teratogenic effects of antimony appear to be conflicting. Female workers in one antimony processing plant experienced higher incidence of late spontaneous abortions, premature births, and gynecologic problems. Exposure of rats to antimony dust resulted in only 50% of the females becoming pregnant, and those that did, produced fewer offspring. Another study, subjecting female rats to antimony oxide dust, produced no evidence of teratogenic effects in the fetuses. And in yet another study, female rabbits that were fed doses of metallic antimony, experienced frequent abortions; while, in a separate study, no fetal toxicity developed in rats or mice following intramuscular doses of antimony dextran glycoside (RL-712), and there was no antimony penetration of the placenta.

MUTAGENICITY: An in vitro study found an increased incidence of human chromosome breakage in leukocytes treated with sodium antimony tartrate. Also, tests of antimony in mammalian cell cultures demonstrated mutagenic activity.

SYNERGISTIC PRODUCTS: When metallic antimony and 3,4-benzopyrene, a carcinogen, were administered together in an intratracheal dose, the former enhanced the lung-retention of the latter in rats' lungs.

SECTION 7 - PREVENTIVE MEASURES AND PERSONAL PROTECTION

It is unlikely that serious overexposure to this product will occur during normal industrial use. Nevertheless, the user must exercise adequate precautions to protect against accidental spills, and to avoid undue exposure to sprays, mists, or vapors that may be inadvertently generated, especially at elevated temperatures. The following protective measures are recommended whenever undue exposure is unavoidable.

- GLOVES:** Oil-impervious and solvent-resistant (e.g. neoprene) type.
- RESPIRATOR:** OSHA/NIOSH-approved supplied-air respirator (SA), or self-contained breathing apparatus (SCBA).
- EYE PROTECTION:** Chemical goggles or, preferably, full face-shield. Do not wear contact lenses in the work area.
- FOOTWEAR:** Oil-impervious (e.g. neoprene) cover and anti-slip sole construction.
- CLOTHING:** Oil-impervious (e.g., neoprene) apron or, preferably, coveralls.
- OTHER PROTECTION:** As deemed necessary.

PERSONAL HYGIENE: Wash hands before eating or smoking. Do not smoke in the work area. Promptly remove contaminated clothing. Immediately clean up any spills, to prevent accidental slipping.

ENGINEERING CONTROLS: General ventilation, normally adequate, should be augmented with local exhaust whenever the TLV/PEL is exceeded, or worker discomfort is reported or observed.

LEAK AND SPILL PROCEDURE: Wear adequate protection and eliminate all sources of ignition. Stop the leak, if it can be safely done. Ventilate the area and dike the spill to prevent entry into sewer or watercourses. Suction or scoop the spill into appropriate disposal or recycling vessels, then cover the spill area with oil-absorbent. Label all waste containers appropriately, including all applicable hazard symbols. If spill enters U.S. navigable waters, the contiguous zone, or adjoining shorelines, notify the Coast Guard National Response Center (Tel. No. 800-424-8802).

WASTE DISPOSAL: Dispose of waste in accordance with applicable Federal, State (or Province), and local laws and regulations. (The services of licensed hazardous waste-disposal facilities may be utilized.) It is the user's responsibility to comply with the U.S. Clean Air Act, Clean Water Act, and Resource Conservation and Recovery Act. Refer to Section 10 - REGULATORY INFORMATION, in this MSDS.

HANDLING PROCEDURES & EQUIPMENT: Exercise prudent precautions to avoid accidental spillage, food contamination, vapor or mist inhalation, eye or skin contact, and ignition of this product.

STORAGE REQUIREMENTS: Store in a clean, dry area below 49°C/120°F, away from all ignition sources and incompatible materials listed in SECTION 5 - REACTIVITY DATA, in this MSDS.

SPECIAL SHIPPING INFORMATION: See SECTIONS 9 & 10, in this MSDS.

SECTION 8 - FIRST AID AND EMERGENCY MEASURES

SKIN: Wipe off, then wash thoroughly with soap and water.

EYES: Flush immediately with water for at least 15 minutes, occasionally lifting the eyelid. Get prompt medical attention.

INHALATION: Immediately remove the individual to fresh air. If breathing is difficult, administer oxygen. If breathing stops, administer artificial respiration. Keep the individual warm and quiet, and get prompt medical attention.

INGESTION: If the individual is conscious, give 1-2 glasses of milk or water to dilute stomach content. Do not physically induce vomiting. Never give anything by mouth to an unconscious person. As with all accidental chemical ingestions, use all available precautions to prevent aspiration of vomitus into the lungs, which may be fatal. Position the patient's head so as to facilitate expulsion of vomitus. Get prompt medical attention.

NOTE TO PHYSICIAN: Intubate the stomach. Aspirate the pharynx as regularly as possible to remove gagged or vomited stomach content.

SECTION 9 - TRANSPORTATION INFORMATION

PRODUCT IDENTIFICATION:	Not applicable.		
DOT PROPER SHIPPING NAME:	Petroleum oil mixture		
DOT HAZARD CLASS:	Not applicable.		
DOT LABEL REQUIRED:	None.		
IMO CLASS:	Not applicable.		
CANADIAN (WHMIS) CLASSIFICATION:	Class: D	Division: 2	Subdivision: B
CANADIAN (TDG ACT) CLASSIFICATION:	Not applicable.		
PACKAGING (PACKING) GROUP:	Not applicable.		
FREIGHT CLASSIFICATION:	Petroleum Lubricating Grease.		

SECTION 10 - REGULATORY INFORMATION

TOXIC SUBSTANCE CONTROL ACT (TSCA): To our best knowledge, all the ingredients in this product have been included, by their manufactures/suppliers, on the TSCA Inventory.

SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT (SARA)

SECTION 302 - EXTREMELY HAZARDOUS SUBSTANCES: This product contains the following ingredient(s) on this list: None.

SECTION 313 - TOXIC CHEMICALS: This product contains the following substance(s) at or above the de minimis concentrations: Antimony compound(s) at 3% (max.).

COMPREHENSIVE ENVIRONMENTAL RESPONSE, COMPENSATION, AND LIABILITY ACT (CERCLA):
Reporting of releases of this product is X required not required.
Antimony compound(s) RQ = 1.0 lb. (CERCLA statutory RQ).

RESOURCE, CONSERVATION, AND RECOVERY ACT (RCRA): This product contains the following ingredient(s) on the Hazardous Wastes List: None.

CALIFORNIA HAZARDOUS SUBSTANCES LIST: This product contains the following substance(s) at or above the de minimis concentrations: Antimony compound(s) at 3% (max.); Molybdenum compound(s) at 2% (max.); Oil at 89% (max.).

CALIFORNIA PROPOSITION 65: This product contains the following substance(s) listed in the Safe Drinking Water and Toxic Enforcement Act of 1986: None.

MICHIGAN CRITICAL MATERIALS: This product contains the following substance(s) at or above the de minimis concentrations: Antimony compound(s) at 3% (max.); Lithium compound (soap) at 15% (max.).

CANADA'S WORKPLACE HAZARDOUS MATERIALS INFORMATION SYSTEM (WHMIS): This product contains the following substance(s) at or above the de minimis concentrations: Antimony compound(s) at 3% (max.); Molybdenum compound(s) at 2% (max.).

SECTION 11 - PREPARATION OF THE MSDS

PREPARED BY:	Nabil N. Saaty, Toxicologist
TELEPHONE NO.:	(213) 679-0271
DATE:	June 22, 1990
SUPERSEDES:	February 5, 1990

The information presented herein has been compiled from sources considered to be dependable, and is, to the best knowledge of Tribol, accurate at the time of this writing. The data in this MSDS relates only to the product(s) designated herein. Tribol makes no warranty whatsoever, expressed or implied, regarding the accuracy of this data or the results to be obtained from the use thereof. Tribol assumes no responsibility for injury to buyer or to third persons, or for any damage to property. Buyer assumes all risks.



DATE: 08/09/89
TIME: 14:00
BY: J. J. J.

Material Safety Data Sheet

NITROGEN, REFRIGERATED LIQUID

Page: 1
Rev. Date
08/09/89

Airco, Division of The BOC Group, Inc.
575 Mountain Avenue
Murray Hill, NJ 07974

Telephone: (201)464-8100

Emergency Contact: CHEMTREC
Emergency Phone Number: (800)424-9300

SECTION #1 - IDENTIFICATION

Product: NITROGEN, REFRIGERATED LIQUID

CAS Number: 7727-37-9
Product Code: MSDS CODE G-101
Chemical Family: Inert Gas
Chemical Formula: Liquified N2
Molecular Weight: 28.00

ynonyms: G-103

Hazard Rating - Health: 2 Moderate
- Fire: 0 Negligible
- Reactivity: 0 Negligible

SECTION #2 - CHEMICAL COMPONENTS

Component: NITROGEN
CAS Number: 7727-37-9 Percent of Mixture: 99.9950 to 99.9990
Simple Asphyxiant - maintain oxygen
levels above 19.5 percent

SECTION #3 - PHYSICAL DATA

Boiling Point: -320.4°F -195.8°C
Melting Point: -345.9°F -209.9°C
Vapor Pressure: Above critical temp.
Vapor Density (Air=1): 0.967
Solubility (H2O): Negligible
Percent Volatiles: 100

NITROGEN, REFRIGERATED LIQUID

SECTION #3 - PHYSICAL DATA Continued...

Appearance

A colorless liquid.

Odor

Odorless.

SECTION #4 - FIRE FIGHTING & EXPLOSION DATA

Flash Point: None

Lower Explosive Limit (%): None

Upper Explosive Limit (%): None

Fire and Explosion Hazards

Non-flammable inert gas!

SECTION #5 - EXPOSURE and EFFECTS - INHALATION

Routes of Exposure - Inhalation

Nitrogen is a simple asphyxiant. Maintain oxygen levels above 19.5% at sea level. Effects of overexposure to high concentrations so as to displace the oxygen in the air necessary for life are headache, dizziness, labored breathing and eventual unconsciousness. Other symptoms may include tightness in the frontal area of the forehead, rapid reduction in the ability to perform movements, loss of tactile sensations, weakened speech leading the inability to utter sounds and tingling of the tongue, fingertips or toes. Nitrogen is nontoxic, but the release of a large amount in a confined area could displace the oxygen in air necessary to support life. It should be recognized that it is possible that none of the above symptoms may occur in nitrogen asphyxia. Thus there are no DEFINITE warning symptoms.

First Aid - Inhalation

PROMPT MEDICAL ATTENTION IS MANDATORY IN ALL CASES OF OVEREXPOSURE. RESCUE PERSONNEL SHOULD BE EQUIPPED WITH SELF-CONTAINED BREATHING APPARATUS.

Conscious persons should be assisted to an uncontaminated area and inhale fresh air. Quick removal from the contaminated area is most important. Unconscious persons should be moved to an uncontaminated area, given artificial resuscitation and supplemental oxygen. Further treatment should be symptomatic and supportive.

SECTION #5 - EXPOSURE and EFFECTS - SKINRoutes of Exposure - Skin

Contact with cryogenic liquid or cold piping can cause tissue freezing or frostbite and cryogenic "burns".

First Aid - Skin

For dermal contact or frostbite, flush affected area with tepid water. DO NOT USE HOT WATER! A physician should see the patient promptly if the cryogenic "burn" has resulted in blistering of the dermal surface or in deep tissue freezing.

SECTION #5 - EXPOSURE and EFFECTS - EYESRoutes of Exposure - Eyes

Contact with cryogenic liquid can cause tissue freezing or frostbite and cryogenic "burns" of the eyes.

First Aid - Eyes

Never introduce ointment or oil into the eyes without medical advice! In case of freezing or cryogenic "burns" caused by rapidly evaporating liquid, DO NOT WASH THE EYES WITH HOT OR EVEN TEPID WATER! Remove victim from the source of contamination. Open eyelids wide to allow liquid to evaporate. If pain is present, refer the victim to an ophthalmologist for treatment and follow up. If the victim cannot tolerate light, protect the eyes with a light bandage.

SECTION #5 - EXPOSURE and EFFECTS - INGESTIONRoutes of Exposure - Ingestion

None known. Ingestion is unlikely. Large quantities of cryogenic liquid may cause freezing of tissue.

First Aid - Ingestion

Ingestion is unlikely. Treat in a similar manner as skin contact. Seek medical attention as soon as possible.

Material Safety Data Sheet

NITROGEN, REFRIGERATED LIQUID

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SECTION #5 - MISCELLANEOUS TOXICOLOGICAL INFORMATION

Carcinogenicity -- NTP: No

IARC: No

OSHA: No

NOTE: Except where specified, the health hazard data and most of the other data in this material safety data sheet are for GASEOUS NITROGEN. One volume of liquid nitrogen at its boiling point and atmospheric pressure will vaporize into approximately 695 volumes of gaseous nitrogen at 70°F (21.1°C) and 1 atmosphere of pressure!

SECTION #6 - REACTIVITY & POLYMERIZATION

Stability: Stable

Conditions to Avoid (Stability)

None known.

Incompatible Materials

None known.

Hazardous Decomposition Products

None known.

Hazardous Polymerization: Will not occur.

SECTION #7 - SPILL, LEAK, & DISPOSAL PROCEDURES

Steps to be Taken in The Event of Spills, Leaks, or Release

Evacuate all personnel from affected areas. Use appropriate protective equipment. If leak is in container or container valve, contact CHEMTREC or your closest Airco location for emergency assistance. Positive pressure air line with mask or self-contained breathing apparatus should be available for emergency use. Do not enter area without respiratory protection due to asphyxiation hazard.

Waste Disposal Methods

Do not attempt to dispose of waste or unused quantities. Return in the shipping container PROPERLY LABELED, WITH ANY VALVE OUTLET PLUGS OR CAPS SECURED AND VALVE PROTECTION CAP IN PLACE to Airco for proper disposal.

NITROGEN, REFRIGERATED LIQUID

SECTION #7 - SPILL, LEAK, & DISPOSAL PROCEDURES Continued...

SARA Hazard Classes: Sudden Release of Pressure Hazard

SECTION #8 - SPECIAL PROTECTIVE MEASURES

Ventilation

Local exhaust to prevent accumulation of high concentrations so as to reduce the oxygen level in the air to less than 19.5 percent. Mechanical in accordance with electrical codes.

Eye Protection

Safety goggles or glasses. For handling the liquid in open vessels, a face shield should be worn in addition to the safety glasses or goggles.

Skin Protection

Use loose fitting insulated gloves to prevent frostbite and cryogenic "burns".

Respiratory Protection

Positive pressure air line with mask or self-contained breathing apparatus should be available for emergency use.

Other Protection

Safety shoes.

SECTION #9 - SPECIAL PRECAUTIONS - STORAGE & HANDLING

Storage & Handling Conditions

Use only in well-ventilated areas in accordance with manufacturer's and Airco/BOC instructions. These cylinders must ALWAYS be kept upright. Specialized trucks are needed for their movement. Do not drag, slide or roll cylinders. Stationary customer site vessels should be operated in accordance with the manufacturer's and Airco/BOC's instructions. Do not attempt to repair, adjust or in any other way modify the operation of these vessels. If there is a malfunction or other type of operations problem with the vessel, contact the closest Airco/BOC location immediately for assistance. Do not store vessels in sub-surface or closed (poorly ventilated) areas. Nitrogen gas can cause suffocation without warning. Liquid nitrogen is delivered into stationary vacuum jacketed vessels at the customer's location or in portable vacuum-jacketed "liquid" cylinders requiring special handling methods.

NITROGEN, REFRIGERATED LIQUID

SECTION #9 - SPECIAL PRECAUTIONS - STORAGE & HANDLING Continued...

Storage & Handling Conditions

Consult manufacturer's instructions.

Special Packaging Recommendations: Liquid nitrogen cannot be handled in carbon or low alloy steels. 18-8 and 18-10 stainless steel and copper, copper alloys, nickel, nickel alloys, brass, bronze, silicon alloys, Monel (R) Inconel (R) and beryllium are acceptable.

For additional recommendations, consult Compressed Gas Association Pamphlets P-9, P-12, P-14 and Safety Bulletin SB-2.

Never carry a compressed gas cylinder or a container of a gas in cryogenic liquid form in an enclosed space such as a car trunk, van or station wagon. A leak can result in a fire, explosion, asphyxiation or a toxic exposure.

Liquid density at Boiling Point : 50.46 lb/ft³ (808.3 Kg/m³).

SECTION #10 - SHIPPING INFORMATION

Proper Shipping Name: Nitrogen, Refrigerated Liquid

Hazard Class: Nonflammable Gas

OT Identification Number: UN1977

DOT Shipping Label: Nonflammable Gas

SECTION #11 - MISC COMMENTS & REFERENCE DOCUMENTATION

Liquid nitrogen vessels should not be refilled except by qualified producers of compressed gases. Shipments of liquid nitrogen vessels, which have not been filled by the owner or with his (written) consent, is a violation of Federal Law (49CFR).

DISCLAIMER OF EXPRESSED AND IMPLIED WARRANTIES

Although reasonable care has been taken in the preparation of this document, we extend no warranties and make no representations as to the accuracy or completeness of the information contained therein, and assume no responsibility regarding the suitability of this information for the user's intended purposes or for the consequences of its use. Each individual should make a determination as to the suitability of the information for their particular purpose(s).



Material Safety Data Sheet*

Chemical Division

CERRO COPPER PRODUCTS COMPANY
MSDS NUMBER - CCPC-CP-0301

FYRQUEL LT

(Fire-Resistant Hydraulic Fluid)

This Material Safety Data Sheet (MSDS) meets the requirements of the federal OSHA Hazard Communication Standard (29 CFR 1910.1200) and the Canadian Controlled Product Regulation, WHMIS classified as: D-2B

New Issue 11/88
Supersedes Issue Dated 11/87
MSDS No. 984412/FYR354

EMERGENCY TELEPHONE NUMBERS

Transportation Emergencies:

USA-CHEMTREC: 1-800-424-9300
CANADA-CANUTEC: 613-996-6666

All Other Emergencies Call:

312-906-7054

I. PRODUCT IDENTIFICATION/COMPOSITION

COMPOSITION:

Butylated triphenyl phosphate ester (30-40%), CAS Registry Number: NAV.

Triphenyl phosphate (10-15%), CAS Registry Number: 115-86-6.

Isodecyl Diphenyl Phosphate (approx. 30%), CAS Registry Number: 29761-21-5.

Petroleum Hydrocarbon Mixture (approx. 20%), CAS Registry Number: NAV.

II. PHYSICAL/CHEMICAL PROPERTIES

The following represent all available, applicable physical hazard data on this product.

PHYSICAL STATE/DESCRIPTION:

Clear, amber liquid; slight odor.

SPECIFIC GRAVITY (WATER = 1):

1.06 at 60°/60°F (15.5°/15.5°C)

VAPOR PRESSURE:

0.1 mm Hg at 75°F (24°C)

POUR POINT:

-40°F (-40°C) max.

FLASH POINT:

400°F (204°C), Cleveland Open Cup

AUTOIGNITION TEMPERATURE:

920°F (493°C)

FIRE POINT:

450°F (232°C)

WATER SOLUBILITY:

1 g/100 ml

VISCOSITY:

145-165 SUS at 100°F (37.8°C)

In Canada: Akzo Chemicals Ltd., 100 University Avenue, Ste. 908,
Toronto, Ontario M5J 1V6

Also referred to as a Product Safety Information Sheet

All information concerning this product and/or all suggestions for handling and use contained herein are offered in good faith and are believed to be reliable. Akzo Chemicals Inc. however, makes no warranty as to the accuracy and/or sufficiency of such information and/or suggestions as to the product's merchantability or fitness for any particular purpose, or that any suggested use will not infringe any patent. Nothing contained herein shall be construed as granting or extending any license under any patent. Buyer must determine for himself, by preliminary tests or otherwise, the suitability of this product for his purposes. The information contained herein supersedes all previously issued bulletins on the subject matter covered.

Akzo Chemicals Inc.
300 S. Riverside Plaza
Chicago, Illinois 60606
(312) 906-7500

FYRQUEL® LT

III. CHEMICAL REACTIVITY

Does not react with air to any appreciable extent at room temperature. Hydrolyzes slowly with water at elevated temperatures. This process is accelerated by the presence of acids or alkalies. No vigorous reactions or evolution of noxious fumes are expected with common acids, alkalies, oxidizing and reducing agents under ambient conditions. This product is not sensitive to static discharge.

IV. STABILITY

Stable at ambient temperature and pressure. In the absence of moisture, it is stable to much higher temperatures. It is not shock sensitive, will not polymerize and requires no special storage facilities.

V. FIRE HAZARD

Not defined as a fire hazard. Under fire conditions, may support combustion and decompose to give off toxic materials such as phosphoric oxides. However, the product is self-extinguishing once the source of ignition is removed. It is not sensitive to static discharge.

VI. FIREFIGHTING TECHNIQUE

Exposure to triphenyl phosphate, which is present in this product, may cause cholinesterase inhibition (refer to SECTION IX: FIRST AID).

Products of combustion are irritating to the respiratory tract and may cause breathing difficulty and pulmonary edema. Symptoms may be delayed several hours or longer depending upon the extent of exposure.

As in any fire, prevent human exposure to fire, smoke, fumes or products of combustion. Evacuate nonessential personnel from the fire area. Firefighters should wear full-face, self-contained breathing apparatus and impervious protective clothing.

Use standard firefighting techniques to extinguish fires involving this material. Use water spray, dry chemicals or carbon dioxide.

Keep fire-exposed containers cool with a water spray to prevent rupture due to excessive heat. High pressure water hose may spread product from broken containers increasing contamination or fire hazard.

Contaminated buildings, areas and equipment must not be used until they are properly decontaminated.

VII. TOXICOLOGY

INGESTION:

The acute oral LD50 is greater than 5000 mg/kg in both male and female rats. A single oral dose of 5000 mg/kg produced decreased physical activity, piloerection, stained fur, lacrimation, chromodacryorrhea, diarrhea and no mortality in female rats. A single oral dose of 5000 mg/kg produced decreased physical activity, diarrhea, stained fur and no mortality in male rats.

SKIN CONTACT:

The acute dermal LD50 is greater than 2000 mg/kg in rabbits. A single dermal application of 2000 mg/kg did not produce signs of toxicity or mortality in rabbits.

Mild irritant to rabbit skin following a 4-hour exposure period.

FYRQUEL[®] LT

EYE CONTACT:

Non-irritant to rabbit eyes.

INHALATION:

The acute inhalation LC50 for Isodecyl diphenyl phosphate, a component of this product, is greater than 2.2 mg/l in rats.

T-11417

VIII. HUMAN HEALTH

Principal routes of exposure are skin contact with the liquid and inhalation of its mists and vapors. Prolonged skin contact with the product may result in mild irritation.

The product contains triphenyl phosphate which has been reported to cause cholinesterase inhibition in humans (1). Symptoms of cholinesterase inhibition may include salivation, sweating, headache, nausea, muscle twitching, tremors, incoordination, blurred vision, tears, abdominal cramps, diarrhea and chest discomfort.

The product contains a petroleum hydrocarbon mixture. Inhalation of high concentrations of mists or vapors of this product may cause headache, dizziness, confusion, excitement, drowsiness or coma.

There are no data available which address medical conditions that are generally recognized as being aggravated by exposure to this product.

IX. FIRST AID

CALL A POISON CENTER OR A PHYSICIAN IMMEDIATELY.

If a known exposure occurs or is suspected, immediately start the recommended procedures below and simultaneously contact a Poison Center, a physician or the nearest hospital.

NOTE: Be sure to advise the person contacted that triphenyl phosphate, a component of this product, has been reported to be a cholinesterase inhibitor in humans (1). Inform the person contacted of the type and extent of exposure, describe the victim's symptoms and follow the advice given.

NOTE TO MEDICAL PERSONNEL:

Exposure to this product may cause cholinesterase inhibition. If cholinesterase inhibition is suspected, atropine by injection is antidotal. 2-PAM (Protopam chloride) is also antidotal when administered early and in conjunction with atropine.

INGESTION:

If swallowed, immediately give several glasses of water and induce vomiting by gagging the victim with a finger placed on the back of the victim's tongue. Give fluids until vomitus is clear. If victim is unconscious or convulsing, do not induce vomiting or give anything by mouth.

SKIN CONTACT:

Flush all affected areas with plenty of water for several minutes. Remove and clean any contaminated clothing and shoes. Seek medical attention if skin irritation occurs.

EYE CONTACT:

Flush the eyes with plenty of running water for several minutes. Seek medical attention if eye irritation occurs.

FYRQUEL[®] LT

INHALATION:

If inhaled, remove to fresh air. Seek medical attention if respiratory irritation occurs or if breathing becomes difficult.

X. INDUSTRIAL HYGIENE

The recommendations described in this section are provided as general guidance for minimizing exposure when handling this product. Because use conditions will vary depending upon customer applications, a person knowledgeable of the intended use conditions and equipment should develop specific safe handling procedures and select appropriate personal protective equipment. During the development of safe handling procedures, consideration should be given to the need for cleaning of equipment and piping systems to render them nonhazardous before maintenance and repair activities are performed.

ENGINEERING CONTROLS:

In those cases where engineering controls are indicated by the use conditions, the following traditional exposure control techniques may be used to effectively minimize employee exposure: local exhaust ventilation, enclosed system design, process isolation and remote control in combination with appropriate use of personal protective equipment.

INGESTION:

All food must be kept in a separate area away from the storage/use location. Eating, drinking, smoking and carrying of tobacco products must be prevented in areas where there is a potential for exposure to this

material. Before eating, drinking, smoking, etc., hands and face must be thoroughly washed.

SKIN PROTECTION:

Skin contact with liquid or its aerosol should be minimized through the use of suitable protective clothing, gloves and footwear. Unprotected skin exposed to vapors, aerosol or mist should be thoroughly washed at the end of the work shift.

EYE PROTECTION:

Eye contact with liquid or its aerosol should be avoided through the use of chemical safety glasses, goggles or a face shield.

RESPIRATORY PROTECTION:

If use conditions generate airborne aerosol, the material should be handled in an open (e.g., outdoor) or well-ventilated area. Where adequate ventilation is not available, use NIOSH-approved, organic vapor respirators with dust, mist and fume filter to reduce exposure. Where exposure potential under the use conditions necessitates a higher level of protection, use a positive-pressure, air-supplied respirator.

EXPOSURE LIMITS:

No exposure limits have been established for this product. However, the product contains triphenyl phosphate for which the following exposure limits apply:

Federal OSHA Permissible Exposure Limit (PEL): 3 mg/m³ as an 8-hour, time-weighted average (2).

FYRQUEL[®] LT

Recommended Threshold Limit Value
(TLV): 3 mg/m³ as an 8-hour,
time-weighted average (2).

PELs and TLVs refer to airborne concentrations measured in the breathing zone by appropriate sampling techniques.

XI. SPILL HANDLING

Make sure all personnel involved in the spill cleanup follow good industrial hygiene practices (refer to SECTION X: INDUSTRIAL HYGIENE).

Any person entering either a significant spill area or an area of unknown concentration of an aerosol should use a positive-pressure, self-contained breathing apparatus or a positive-pressure, air-supplied respirator with escape pack.

Soak up pooled liquid with a suitable absorbent such as clay, sawdust or kitty litter. Sweep up absorbed material being careful not to create dust, and place in a chemical waste container for disposal (refer to SECTION XIV: DISPOSAL OF MATERIAL/CONTAINER). Generously cover contaminated area with a slurry of common, household, powdered laundry detergent and water. Using a stiff brush, work the slurry into cracks and crevices. Allow to stand for 2-3 minutes then flush with water. Repeat if necessary.

Large spills should be diked and pumped to salvage according to a predetermined plan.

XII. CORROSIVITY TO MATERIALS OF CONSTRUCTION

Noncorrosive to glass and metals. However, because the product has plasticizing properties, it may soften or deteriorate certain plastics and elastomers (particularly vinyl-based resins, neoprene and natural rubbers).

XIII. STORAGE REQUIREMENTS

Containers should be stored in a cool, dry, well-ventilated area away from flammable materials and sources of heat or flame. Store away from foodstuffs or animal feed. Exercise due caution to prevent damage to or leakage from the container.

Prolonged storage at elevated temperatures under wet alkaline conditions should be avoided. Care should be taken to prevent moisture condensation in the container.

Carbon steel is the preferred material of construction for storage containers. The material is commonly shipped in unlined tank cars, tank trucks and drums.

XIV. DISPOSAL OF MATERIAL/CONTAINER

Material that cannot be used or chemically reprocessed and empty containers should be disposed of at an approved facility in accordance with any applicable regulations. NOTE: State and local regulations may be more stringent than federal.

XV. PREPARATION INFORMATION

Prepared by: Product Stewardship, Akzo
Chemicals Inc., Chicago, Illinois,
(312)906-7500.

FYRQUEL® LT

REFERENCES CITED:

(1) American Conference of Governmental Industrial Hygienists (ACGIH), Documentation of the Threshold Limit Values for Substances in Workroom Air, 5th ed., ACGIH: Cincinnati, OH, pg. 613, 1986.

(2) 29 CFR 1910.1000

(3) American Conference of Governmental Industrial Hygienists (ACGIH), Threshold Limit Values and Biological Exposure Indices for 1988-89, ACGIH: Cincinnati, OH, 1988.

MATERIAL SAFETY DATA SHEET

BASF Corporation Chemicals Division
100 Cherry Hill Road, Parsippany, New Jersey 07054 (201) 316-3000

BASF

DEARBORN COPPER PRODUCTS COMPANY
MSDS NUMBER - CCPC-05-0302

PRODUCT NUMBER: 526251 EP-290

SECTION I

TRADE NAME: EP-290

CHEMICAL NAME: N/A

SYNONYMS: Heavy Oxo Ends; HOE

FORMULA: Mixture

CHEMICAL FAMILY: Oxo Compounds

MOL WGT.: N/A

SECTION II - INGREDIENTS

COMPONENT	CAS NO.	%	PEL/TLV - SOURCE
EP-290 Contains:	68526-82-9	100	Not established
Undecyl Alcohol	68516-18-7	~4	Not established
Higher Alcohols		~58-66	Not established
SARA Title III Sect. 313: Not listed.			

SECTION III - PHYSICAL DATA

BOILING/MELTING POINT @760 mm Hg: >230°F @ 20 mm Hg	pH: 5.9-6.0
VAPOR PRESSURE mm Hg @20 C: <0.1	Melting point: N/A
SPECIFIC GRAVITY OR BULK DENSITY: 0.857 @ 25°C	
SOLUBILITY IN WATER: <0.1 % @ 25°C	Color: Straw
APPEARANCE: Clear liquid	ODOR: Characteristic INTENSITY: Mild

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (TEST METHOD): >230°F (T.C.C.)	AUTOIGNITION TEMP: N/A
FLAMMABILITY LIMITS IN AIR (% BY VOL)	LOWER: N/A UPPER: N/A
EXTINGUISHING MEDIUM	Use water fog, alcohol foam, CO2 or dry chemical extinguishing media.
SPECIAL FIREFIGHTING PROCEDURES	Firefighters should be equipped with self-contained breathing apparatus and turn out gear. Water may be ineffective but should be used to keep exposed containers cool.
UNUSUAL FIRE AND EXPLOSION HAZARDS	None.

EMERGENCY TELEPHONE NUMBER

CHEMTREC 800-424-9300

201-316-3000

THIS NUMBER IS AVAILABLE DAYS, NIGHTS, WEEKENDS, AND HOLIDAYS

SECTION V - HEALTH DATA**TOXICOLOGICAL TEST DATA:**

Rat, Oral LD50	>15,800 mg/kg.
Rabbit, Dermal LD50	>7,940 mg/kg.
Rabbit, Eye Irritation (1.3/110)	Slightly irritating.
Rabbit, Skin Irritation (1.8/8.0)	Slightly irritating.
Rat, Inhalation Screen - 1 of 10 rats died after exposure to 4.8 mg/l (oxo-ends/air) for 4 hours.	Slightly toxic if inhaled.
Human repeated insult patch test - based on studies with 55 volunteers, not a primary irritant, cumulative irritant or sensitizer.	

RESULT:**EFFECTS OF OVEREXPOSURE:**

May cause slight irritation of the skin and eyes if repeated or prolonged contact occurs. May cause defatting of the skin and dermatitis upon repeated skin contact.

FIRST AID PROCEDURES:

Eyes-Immediately wash eyes with running water for 15 minutes. If irritation develops, consult a physician.

Skin-Wash affected areas with soap and water. Remove and launder contaminated clothing before reuse. If irritation develops, consult a physician.

Ingestion-If swallowed, dilute with water and immediately induce vomiting. Never give fluids or induce vomiting if the victim is unconscious or having convulsions. Get immediate medical attention.

Inhalation-Move to fresh air. Aid in breathing, if necessary, and get immediate medical attention.

SECTION VI - REACTIVITY DATA

STABILITY: Stable.

CONDITIONS TO AVOID: Excessive heat and ignition sources.

CHEMICAL INCOMPATIBILITY: Strong oxidizing agents.

HAZARDOUS DECOMPOSITION PRODUCTS: CO, CO2.

HAZARDOUS POLYMERIZATION: Does not occur

CONDITIONS TO AVOID: N/A

CORROSIVE TO METAL: No

OXIDIZER: No

SECTION VII - SPECIAL PROTECTION

RESPIRATORY PROTECTION: NIOSH/MSHA-approved organic vapor respirator as necessary.

EYE PROTECTION: Chemical goggles.

PROTECTIVE CLOTHING: Gloves, coveralls, apron, boots as necessary to prevent skin contact.

VENTILATION: Use local exhaust to control vapors/mists.

OTHER: Eyewash fountains and safety showers should be easily accessible.

SECTION VIII - ENVIRONMENTAL DATA**ENVIRONMENTAL TOXICITY DATA:**

48 hour LC50, Daphnia magna: 0.17 mg/l, highly toxic
 96 hour LC50, Rainbow trout: >1000 mg/l, practically nontoxic
 96 hour LC50, Bluegill sunfish: >1000 mg/l, practically nontoxic

SPILL AND LEAK PROCEDURES:

Spills should be contained, solidified, and placed in suitable containers for disposal. This material is not regulated under RCRA or CERCLA ("Superfund").

HAZARDOUS SUBSTANCE SUPERFUND: No RQ (lbs):

WASTE DISPOSAL METHOD:

Incinerate or bury in a licensed facility.
 Do not discharge into waterways or sewer systems without proper authority.

HAZARDOUS WASTE 40CFR261: No HAZARDOUS WASTE NUMBER:

CONTAINER DISPOSAL:

Dispose of in licensed facility.
 Recommend crushing or other means to prevent unauthorized reuse.

SECTION IX - SHIPPING DATA

D.O.T. PROPER SHIPPING NAME (49CFR172.101-102)

None

HAZARDOUS SUBSTANCE
(49CFR CERCLA LIST)

No

REPORTABLE QUANTITY (RQ) N/A

D.O.T. HAZARD CLASSIFICATION (CFR172.101-102)
PRIMARY

None

SECONDARY

D.O.T. LABELS REQUIRED (49CFR172.101-102)

None

D.O.T. PLACARDS
REQUIRED (CFR172.504)

None

POISON CONSTITUENT
(49CFR172.203(K))**BILL OF LADING DESCRIPTION**

Inedible Fatty Alcohols, petroleum, NOIBN

CC NO. 880

UN/NA CODEN/A

DATE PREPARED: 9 / 4 / 86

UPDATED: 12 / 2 / 88

WHILE BASF CORPORATION BELIEVES THE DATA SET FORTH HEREIN ARE ACCURATE AS OF THE DATE HEREOF, BASF CORPORATION MAKES NO WARRANTY WITH RESPECT THERETO AND EXPRESSLY DISCLAIMS ALL LIABILITY FOR RELIANCE THEREON. SUCH DATA ARE OFFERED SOLELY FOR YOUR CONSIDERATION, INVESTIGATION, AND VERIFICATION.

SECTION X - PRODUCT LABEL

EP-290

CAUTION:

PROLONGED OR REPEATED CONTACT WITH EYES AND SKIN MAY RESULT IN SLIGHT IRRITATION. DEFATTING OF THE SKIN AND DERMATITIS MAY OCCUR UPON REPEATED SKIN CONTACT.

Use with local exhaust. Wear a NIOSH-MSHA approved organic vapor respirator, chemical goggles, gloves, coveralls, apron, boots and other protective clothing as necessary to prevent contact. Eyewash fountains and safety showers must be easily accessible.

FIRST AID:

Eyes-Immediately wash eyes with running water for 15 minutes.

If irritation develops, consult a physician.

Skin-Wash affected areas with soap and water. Remove and launder contaminated clothing before reuse. If irritation develops, consult a physician.

Ingestion-If swallowed, dilute with water and immediately induce vomiting. Never give fluids or induce vomiting if the victim is unconscious or having convulsions. Get immediate medical attention.

Inhalation-Move to fresh air. Aid in breathing, if necessary, and get immediate medical attention.

STORAGE AND HANDLING: Avoid excessive heat and sources of ignition.

IN CASE OF FIRE: Use water fog, foam, CO2 or dry chemical extinguishing media. Firefighters should be equipped with self-contained breathing apparatus and turn-out gear.

EMPTY CONTAINERS: All labeled precautions must be observed when handling, storing and transporting empty containers due to product residues. Do not reuse this container unless it is professionally cleaned and reconditioned.

DISPOSAL: Spilled material, unused contents and empty containers must be disposed of in accordance with local, state and federal regulations. Refer to our Material Safety Data Sheet for specific disposal instructions.

IN CASE OF CHEMICAL EMERGENCY: Call CHEMTREC day or night for assistance and information concerning spilled material, fire, exposure and other chemical accidents 800-424-9300.

ATTENTION: This product is sold solely for use by industrial institutions.

Refer to our Technical Bulletin and Material Safety Data Sheet regarding safety, usage, applications, hazards, procedures and disposal of this product. Consult your supervisor for additional information.

CAS No.: 68526-82-9.

Made in USA.

Basic Organic Chemicals

1288

MATERIAL SAFETY DATA SHEET

Required under USDL Safety and Health
Shipbuilding, and Shipbreaking (2

CERRO COPPER PRODUCTS COMPANY
MERCANTILE COMPANY

SECTION I

MANUFACTURER'S NAME BIG RIVER ZINC CORPORATION		EMERGENCY TELEPHONE NO. 618-274-5000
ADDRESS (Number, Street, City, State, and ZIP Code) ROUTE 3 & MONSANTO AVENUE SAUCET, ILLINOIS 62201		
CHEMICAL NAME AND SYNONYMS Sulfuric Acid	TRADE NAME AND SYNONYMS Sulfuric Acid	
CHEMICAL FAMILY Acid	FORMULA H₂SO₄	CAS No. 7664-93-9

SECTION II - HAZARDOUS INGREDIENTS

PAINTS, PRESERVATIVES, & SOLVENTS	%	TLV (Unit)	ALLOYS AND METALLIC COATINGS	%	TLV (Unit)
PIGMENTS			BASE METAL		
CATALYST			ALLOYS		
VEHICLE			METALLIC COATINGS		
SOLVENTS			FILLER METAL PLUS COATING OR CORE FLUX		
ADDITIVES			OTHERS		
OTHERS					
HAZARDOUS MIXTURES OF OTHER LIQUIDS, SOLIDS, OR GASES				%	TLV (Unit)
Hydrogen Sulfate (H ₂ SO ₄)				93	1 mg/m ³
Water				7	

SECTION III - PHYSICAL DATA

BOILING POINT (°F.)	535	SPECIFIC GRAVITY (H ₂ O=1)	1.835
VAPOR PRESSURE (mm Hg.)		PERCENT VOLATILE BY VOLUME (%)	
VAPOR DENSITY (AIR=1)		EVAPORATION RATE (_____=1)	
SOLUBILITY IN WATER	100%	Melting Point	-31°F
APPEARANCE AND ODOR Colorless, oily liquid. May have weak acid odor.			

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (Method used) Non-flammable	FLAMMABLE LIMITS	Lel	Uel
EXTINGUISHING MEDIA DO NOT ADD WATER OR OTHER LIQUID TO ACID			
SPECIAL FIRE FIGHTING PROCEDURES Acid diluted with water will liberate hydrogen when reacting with metals.			
UNUSUAL FIRE AND EXPLOSION HAZARDS Use self-contained breathing apparatus and protective clothing when exposed to acid mist or vapors.			

SECTION V - HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE 1 mg/m^3

EFFECTS OF OVEREXPOSURE

Rapid burning of eyes and skin on contact. Inhalation of mist may damage respiratory tract. Ingestion may cause death.

EMERGENCY AND FIRST AID PROCEDURES

Immediately wash eyes and skin with running water for an extended period of time. If ingested, administer large amounts of milk or water, then neutralize with milk of magnesia. IN ALL CASES, OBTAIN MEDICAL HELP IMMEDIATELY.

SECTION VI - REACTIVITY DATA

STABILITY

UNSTABLE

CONDITIONS TO AVOID

STABLE

X

INCOMPATIBILITY (Materials to avoid)
DO NOT ADD WATER TO ACID

HAZARDOUS DECOMPOSITION PRODUCTS

Reacts with bases and metals - strong oxidizing agent

HAZARDOUS POLYMERIZATION

MAY OCCUR

CONDITIONS TO AVOID

WILL NOT OCCUR

X

SECTION VII - SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

Dilute with excessive amount of water or neutralize with soda ash or lime

WASTE DISPOSAL METHOD

Comply with federal, state and local requirements

SECTION VIII - SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION (Specify type)

NIOSH approved respiratory protection when exposed to acid in excess of the TLV

VENTILATION

LOCAL EXHAUST

Yes, to maintain acid vapor and mist

SPECIAL

MECHANICAL (General)

Levels below the TLV

OTHER

PROTECTIVE GLOVES

Rubber gloves

EYE PROTECTION

Chemical splash goggles

OTHER PROTECTIVE EQUIPMENT

Rubber suit, apron etc. to prevent skin contact with acid

SECTION IX - SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING

Store in well-ventilated area on acid resistant floors. Do not store with reactive materials, oxidizers etc.

OTHER PRECAUTIONS

Any questions concerning this MSDS should be addressed to:

GUNCLASE

COMBUSTION ENGINEERING, INC.
CORPORATE HEALTH & SAFETY
WINDSOR, CT
Phone: (203) 285-9693

MANUFACTURER: BASIC INCORPORATED
ADDRESS: Subsidiary of Combustion
Engineering, Inc.
P. O. Box 828
Valley Forge, PA 19482
Phone: (215) 337-1100

SECTION I, MATERIAL IDENTIFICATION

Material Name: GUNCLASE[®]
Types: GUNCLASE E, GUNCLASE EF
Description: Inorganic Mixutre
GUNCLASE[®] is a granular basic refractory consisting of high-purity periclase (MgO) with a chromic acid bond.

SECTION II, INGREDIENTS AND HAZARDS

Ingredient Name	CAS	%	Listed as a Carcinogen in NTP, IARC or OSHA 1910(z) (specify)
Magnesite	1309-48-4	95+	No
Boric Acid	10043-35-3	1- 2	No
Chromic Acid	1332-82-0	1- 2	Yes, NTP

The PEL/TLV for this mixture is 2.9 mg/m³* respirable dust.

Chromic Acid is listed in the National Toxicology Program's (NTP) third annual report on carcinogens with an OSHA Permissible Exposure Limit (PEL) for an 8 hour time-weighted average of 0.1 mg/m³ maximum. Refer to Section VI for applicable Health Hazard data and Section VIII for Special Protection information and comments.

SECTION III, PHYSICAL DATA

Appearance and odor: Light yellow green, no distinguishable odor.

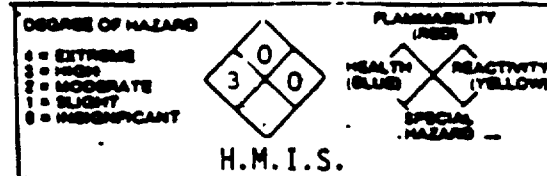
Boiling Point: NA	Evaporation Rate: NA
Vapor Pressure: NA	Specific Gravity (water=1): 2.7
Water Solubility (%): 2	Melting Point: NA
Vapor Density (Air=1): NA	% Volatile by Wt: 0
	PH (10% Sol.): 3-4

SECTION IV, FIRE AND EXPLOSION DATA

Unusual fire or explosion hazard: None
This product is non-combustible. Use extinguishing media appropriate to the surrounding area.

SECTION V, REACTIVITY DATA

This material is stable; however, it hydrates slowly with the generation of some heat and should be kept dry. Avoid organic material, contains strong oxidizer. Avoid accidental water leaching of Chromic Acid.



H.M.I.S.

SECTION VI, HEALTH HAZARD DATA

Dust from GUNCLASE can cause irritation to the eyes on contact. Acid crystals or concentrations of chromic acid to the skin can cause severe burns. Swallowing may cause severe injury or death.

Emergency and First Aid Procedures

Eyes: Promptly flush 15 minutes or more with water. Consult physician.

Skin: Flush and wash with water and a mild soap.

Inhalation: Irrigate nose and mouth with salt water.

Ingestion: Induce vomiting and drink olive oil.

Chromic Acid is listed in the National Toxicology Program's (NTP) third annual report on carcinogens with an OSHA Permissible Exposure Limit (PEL) for an 8 hour time-weighted average of 0.1 mg/m³ maximum.

SECTION VII, SPILL, LEAK AND DISPOSAL

Pick up by scooping, sweeping or vacuum. Avoid raising dust clouds. Flush area with water. Neutralize with soda ash.

DISPOSAL: Consult local State and Federal disposal regulation to determine correct method.

SECTION VIII, SPECIAL PROTECTION INFORMATION

Provide adequate general and local exhaust ventilation to meet PEL requirements. Provide workers with dust respirators for use in emergency or nonroutine situations where dust levels may exceed PEL. A NIOSH approved half face piece respirator can be used for exposures up to 10X PEL. Protect eyes, skin and open cuts from dust, mists and splashes.

Workers should wear goggles for eye protection, gloves, and protective clothing appropriate for the work situation.

SECTION IX, SPECIAL PRECAUTIONS AND COMMENTS

Keep dust in work area at a minimum and maintain air concentration of dust as far below PEL as feasible. Use good housekeeping techniques, such as, vacuuming to remove collected dust and prevent formation of dust clouds. Avoid inhalation of dust. Avoid eye contact or prolonged skin contact with material. Tear out of refractory materials may lead to the generation of substantial concentrations of dust. Workers should be advised of the potential hazards and trained in proper use of protective equipment.

Although reasonable care has been taken in the preparation of the information contained herein, Combustion Engineering, Inc. extends no warranties, makes no representation and assumes no responsibility as to the accuracy or suitability of such information for application to purchaser's intended purposes or for consequences of its use.

Prepared By: Al Momme
QC Engineer

DATE PREPARED: 9/76

REVISED: 8/85 10/85 11/85 3/86 8/87 12/87 3/88

PRODUCT #: MP524-MP526-MP543

MATERIAL SAFETY DATA SHEET

COOK'S INDUSTRIAL LUBRIC
5 NORTH STILES STREET
LINDEN, N.J. 07036

CERRO COPPER PRODUCTS COMPANY
MSDS NUMBER - CCPC-00-0006

REVISION DATE
13-JUL-89

DATE ISSUED
21-AUG-90

IDENTIFICATION AND EMERGENCY INFORMATION

COOK'S PRODUCT NAME:
COOK'S DRAW 1575

COOK'S PRODUCT #:
A2A902A

CHEMICAL NAME:
Mixture of Petroleum Soap-based
Grease and Graphite

CAS #'S:
Mixture

PRODUCT APPEARANCE AND ODOR:
Gray Gel, petroleum odor

CHEMICAL FAMILY:
Petroleum hydrocarbon

SYNONYMS:
Petroleum-based Grease

EMERGENCY TELEPHONE:
(201) 862-2500

COMPONENTS AND HAZARD INFORMATION

COMPONENTS: W/W HAZARD DATA (TLV, LD50, LC50, ETC.):

petroleum-based lubricating oil
CAS #'S 64742-53-6 or
64742-52-5

TLV 5 mg./meter cubed
(as an oil mist)

Graphite CAS # 7782-42-5

PEL 15 MPPCF

Fatty acids, tallow, calcium salts
CAS # 64755-01-7

n/e

Proprietary additives

n/e

HAZARDOUS MATERIALS IDENTIFICATION SYSTEM (HMIS):

Health	Flammability	Reactivity	Basis
1	1	0	Recommended by Exxon

TRANSPORTATION INFORMATION

TRANSPORTATION INCIDENT INFORMATION:

ICC: Compound or lubricant. Metal cutting, drawing or drilling.
Dry, liquid or paste. NOI

EMERGENCY FIRST AID

EYE CONTACT:

If splashed into the eyes, flush with clear water for 15 minutes or until irritation subsides. If irritation persists, call a physician.

EMERGENCY FIRST AID

SKIN CONTACT:

In case of skin contact, remove contaminated clothing and wash skin thoroughly with soap and water.

INHALATION:

Vapor pressure is very low. Vapor inhalation under ambient conditions is normally not a problem. If overcome by vapor from hot product, immediately remove from exposure and call a physician. If breathing is irregular or has stopped, start resuscitation; administer oxygen if available. If overexposure to oil mist, remove from further exposure until excessive oil mist condition subsides.

INGESTION:

If ingested, do not induce vomiting. Call a physician immediately.

FIRE AND EXPLOSION HAZARD INFORMATION

FLASH POINT (MINIMUM):

160°C (320°F) Test method: COC

AUTOIGNITION TEMPERATURE:

N/E

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) - HAZARD IDENTIFICATION:

Health	Flammability	Reactivity	Basis
1	1	0	Recommended by Exxon

FLAMMABLE OR EXPLOSIVE LIMITS (approximate percent by volume in air):

Estimated values: lower 1% upper 6%

TINGUISHING MEDIA AND FIRE FIGHTING PROCEDURES:

Foam, water spray (fog), dry chemical, carbon dioxide and vaporizing liquid type extinguishing agents may all be suitable for extinguishing fires involving this type product, depending on size or potential size of fire and circumstances related to the situation. Plan fire protection and response strategy through consultation with local fire protection authorities or appropriate specialists.

The following procedures for this type of product are based on the recommendations in the National Fire Protection Association's "Fire Protection Guide on Hazardous Materials", Eighth Edition (1984):

Use water spray, dry chemical, foam, or carbon dioxide. Water or foam may cause frothing. Use water to keep fire-exposed containers cool. Water froth may be used to flush spills away from exposure. Minimize breathing gases, vapor, fumes, or decomposition products. Use supplied-air breathing equipment for enclosed or confined spaces or as otherwise needed.

UNUSUAL FIRE AND EXPLOSION HAZARDS:

n/a

"EMPTY" CONTAINER WARNING:

Empty containers retain residue (liquid or vapor) and can be dangerous. DO NOT PRESSURIZE, WELD, CUT BRAZE, SOLDER, DRILL, GRIND OR EXPOSE SUCH CONTAINERS TO HEAT, FLAME, SPARKS, OR OTHER SOURCES OF IGNITION; THEY MAY EXPLODE AND CAUSE INJURY OR DEATH. Do not attempt to clean since residue is difficult to remove. "Empty" drums should be completely drained, properly bunged, and returned to a drum reconditioner. All other containers should be disposed of in an environmentally safe manner and in accordance with government regulations. For work on tanks refer to Occupational Safety and

FIRE AND EXPLOSION HAZARD INFORMATION

Health Administration regulations, ANSI Z49.1, and other governmental and industrial references pertaining to cleaning, repairing, welding, or other contemplated operations.

HEALTH AND HAZARD INFORMATION

EXPOSURE LIMIT FOR TOTAL PRODUCT:

5 mg/cubic meter for oil mist in air

BASIS:

OSHA Regulation 29 CFR 1910.1000

VARIABILITY AMONG INDIVIDUALS:

Health studies have shown that many petroleum hydrocarbons and synthetic lubricants pose potential human health risks which vary from person to person. As a precaution, exposure to liquids, vapors, mists, or fumes should be minimized.

EFFECTS OF OVEREXPOSURE (Signs and symptoms of exposure):

Prolonged or repeated skin contact with this product tends to remove skin oils possibly leading to irritation and dermatitis; however, based on human experience and available toxicological data, this product is judged to be neither a "corrosive" nor an "irritant" by OSHA criteria. Product contacting the eye may cause irritation.

Product has a low order of oral and dermal toxicity. Possible aspiration hazard. Induced vomiting may cause aspiration of product into the lungs. (See Emergency First Aid Section).

PHYSICAL DATA

The following data are approximate or typical values and should not be used for precise design purposes.

BOILING RANGE:

Wide range

VAPOR PRESSURE:

< 0.1 @ 38°C/100°F

SPECIFIC GRAVITY (25°C/25°C):

(WATER = 1)

< 1.0

VAPOR DENSITY (AIR = 1):

> 8

MOLECULAR WEIGHT:

Wide range

PERCENT VOLATILE BY VOLUME:

Negligible

EVAPORATION RATE @ 1 ATM. AND 25°C

(77°F) (n-BUTYL ACETATE = 1):

< 1.0

SOLUBILITY IN WATER @ 1 ATM. and 25°C

(77°F):

Negligible

POUR, CONGEALING OR MELTING POINT:

n/a

FREEZING POINT:

n/a

REACTIVITY

This product is stable and will NOT react violently with water. Hazardous polymerization will not occur. Avoid contact with strong oxidants such as liquid chlorine, concentrated oxygen, sodium hypochlorite or calcium hypochlorite.

REACTIVITY

DECOMPOSITION PRODUCTS UNDER FIRE CONDITIONS:

mes, smoke, carbon monoxide and other decomposition products, in case of incomplete combustion.

CONDITIONS TO AVOID:

Open flames.

TOXICITY

ORAL (Acute)	LD 50 > 5 g/kg (total body weight)
DERMAL (Acute)	LD 50 > 3.16 g/kg (total body weight)
EYE	N/E
INHALATION (Acute)	N/E
CHRONIC, SUBCHRONIC, ETC.	N/E

Medical Conditions Aggravated by Exposure: Unknown

This product does NOT contain any ingredients identified as carcinogenic by IRAC, NTP, or OSHA.

SARA Section 313 Status:

This material is not known to contain any chemicals on the SARA Section 313 list at a concentration greater than 1.0 percent or carcinogenic chemical on that list at a concentration greater than 0.1 percent.

SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED:

Keep product out of sewers and watercourses by diking or impounding. Absorb with sand or inert material. Sweep or scoop up and remove. Prevent spread of spill. Advise authorities if product has entered or may enter sewers, watercourses or extensive land areas. Assure conformity with local regulations

WASTE DISPOSAL METHOD: (Consult federal, state, or local authorities for proper disposal procedures.)

Assure conformity with applicable disposal regulations. Dispose of absorbed material at an approved waste site or facility.

PROTECTION AND PRECAUTIONS

VENTILATION: (Always maintain below permissible exposure limits.)

Use local exhaust to capture vapor, mist or fumes, if necessary. Provide greater than 60 feet per minute hood face velocity for confined spaces. Provide ventilation sufficient to prevent exceeding recommended exposure limit or buildup of explosive concentrations of vapor in air.

RESPIRATORY PROTECTION: (Use only NIOSH approved equipment.)

Normally not needed at ambient temperatures. Use supplied air respiratory protection in confined or enclosed spaces, if needed. Use filter, dust, fume, mist respirator type under misting conditions. Use can or cartridge gas or vapor respirator type under conditions exceeding TWA standard.

PROTECTION AND PRECAUTIONS

PROTECTIVE GLOVES:

Use chemical-resistant gloves, if needed, to avoid prolonged or repeated skin contact.

EYE PROTECTION:

Use splash goggles or face shield when eye contact may occur.

OTHER PROTECTIVE EQUIPMENT:

Use chemical-resistant apron or other impervious clothing, if needed, to avoid contaminating regular clothing which could result in prolonged or repeated skin contact.

WORK PRACTICES/ENGINEERING CONTROLS:

Keep containers closed when not in use. Do not handle near heat, sparks, flame, or strong oxidants.

PERSONAL HYGIENE:

Minimize breathing vapor, mist, or fumes. Avoid prolonged or repeated contact with skin. Remove contaminated clothing; launder or dry-clean before reuse. Remove contaminated shoes and thoroughly clean before reuse; discard if oil-soaked. Cleanse skin thoroughly after contact, before breaks and meals, and at end of work period. Product is readily removed from skin by waterless hand cleaners followed by washing thoroughly with soap and water.

PREPARED BY: Dave Townsend Product Safety Manager

THE ABOVE INFORMATION IS ACCURATE TO THE BEST OF OUR KNOWLEDGE. HOWEVER, SINCE DATA, SAFETY STANDARDS, AND GOVERNMENT REGULATIONS ARE SUBJECT TO CHANGE AND THE CONDITIONS OF HANDLING AND USE, OR MISUSE ARE BEYOND OUR CONTROL, SELLER MAKES NO WARRANTY, EITHER EXPRESS OR IMPLIED, WITH RESPECT TO THE COMPLETENESS OR CONTINUING ACCURACY OF THE INFORMATION CONTAINED HEREIN AND DISCLAIMS ALL LIABILITY FOR RELIANCE THEREON. USER SHOULD SATISFY HIMSELF THAT HE HAS ALL CURRENT DATA RELEVANT TO HIS PARTICULAR USE.

MATERIAL SAFETY DATA SHEET

COOK'S INDUSTRIAL LUBRICANTS
5 NORTH STILES STREET
LINDEN, N. J. 07036

REVISION DATE
23-MAY-90

DATE ISSUED
23-MAY-90

IDENTIFICATION AND EMERGENCY INFORMATION

COOK'S PRODUCT NAME:
COOK'S DRAW 1575-27

COOK'S PRODUCT #:
A2A912A

CHEMICAL NAME:
Mixture of Petroleum Soap-based
Grease and Graphite

CAS #'S:
Mixture

PRODUCT APPEARANCE AND ODOR:
Black Gel, petroleum odor

CHEMICAL FAMILY:
Petroleum hydrocarbon

SYNONYMS:
Petroleum-based Grease

EMERGENCY TELEPHONE:
(201) 862-2500

COMPONENTS AND HAZARD INFORMATION

COMPONENTS:	W/W	HAZARD DATA (TLV, LD50, LC50, ETC.):
Asphalt CAS # 8052-42-4	20-25	TLV 5 mg./meter cubed (as a mist)
Petroleum-based lubricating oil CAS #'S 64742-53-6 or 64742-52-5	20-25	TLV 5 mg./meter cubed (as an oil mist)
Calcium Oleate CAS # 142-17-6	10-15	n/e
Graphite CAS # 7782-42-5	25-30	TLV 15 MPPCF

HAZARDOUS MATERIALS IDENTIFICATION SYSTEM (HMIS):

Health	Flammability	Reactivity	Basis
1	1	0	Recommended by Exxon

TRANSPORTATION INFORMATION

TRANSPORTATION INCIDENT INFORMATION:

ICC: Compound or lubricant. Metal cutting, drawing or drilling.
Dry, liquid or paste. NOI

EMERGENCY FIRST AID

EYE CONTACT:

If splashed into the eyes, flush with clear water for 15 minutes or until

EMERGENCY FIRST AID

irritation subsides. If irritation persists, call a physician.

SKIN CONTACT:

In case of skin contact, remove contaminated clothing and wash skin thoroughly with soap and water.

INHALATION:

Vapor pressure is very low. Vapor inhalation under ambient conditions is normally not a problem. If overcome by vapor from hot product, immediately remove from exposure and call a physician. If breathing is irregular or has stopped, start resuscitation; administer oxygen if available. If overexposure to oil mist, remove from further exposure until excessive oil mist condition subsides.

INGESTION:

If ingested, do not induce vomiting. Call a physician immediately.

FIRE AND EXPLOSION HAZARD INFORMATION

FLASH POINT (MINIMUM):

160°C (320°F) Test method: COC

AUTOIGNITION TEMPERATURE:

N/E

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) - HAZARD IDENTIFICATION:

Health	Flammability	Reactivity	Basis
1	1	0	Recommended by Exxon

FLAMMABLE OR EXPLOSIVE LIMITS (approximate percent by volume in air):

Estimated values: lower 1% upper 6%

EXTINGUISHING MEDIA AND FIRE FIGHTING PROCEDURES:

Foam, water spray (fog), dry chemical, carbon dioxide and vaporizing liquid type extinguishing agents may all be suitable for extinguishing fires involving this type product, depending on size or potential size of fire and circumstances related to the situation. Plan fire protection and response strategy through consultation with local fire protection authorities or appropriate specialist.

The following procedures for this type of product are based on the recommendations in the National Fire Protection Association's "Fire Protection Guide on Hazardous Materials", Eighth Edition (1984):

Use water spray, dry chemical, foam, or carbon dioxide. Water or foam may cause frothing. Use water to keep fire-exposed containers cool. Water froth may be used to flush spills away from exposure. Minimize breathing gases, vapor, fumes, or decomposition products. Use supplied-air breathing equipment for enclosed or confined spaces or as otherwise needed.

UNUSUAL FIRE AND EXPLOSION HAZARDS:

n/a

"EMPTY" CONTAINER WARNING:

Empty containers retain residue (liquid or vapor) and can be dangerous. DO NOT PRESSURIZE, WELD, CUT BRAZE, SOLDER, DRILL, GRIND OR EXPOSE SUCH CONTAINERS TO HEAT, FLAME, SPARKS, OR OTHER SOURCES OF IGNITION; THEY MAY EXPLODE AND CAUSE INJURY OR DEATH. Do not attempt to clean since residue is difficult to remove. "Empty" drums should be completely drained, properly bunged, and returned to a drum reconditioner. All other containers should be

FIRE AND EXPLOSION HAZARD INFORMATION

disposed of in an environmentally safe manner and in accordance with government regulations. For work on tanks refer to Occupational Safety and Health Administration regulations, ANSI Z49.1, and other governmental and industrial references pertaining to cleaning, repairing, welding, or other contemplated operations.

HEALTH AND HAZARD INFORMATION

EXPOSURE LIMIT FOR TOTAL PRODUCT:

5 mg/cubic meter for oil mist in air

BASIS:

OSHA Regulation 29 CFR 1910.120

VARIABILITY AMONG INDIVIDUALS:

Health studies have shown that many petroleum hydrocarbons and synthetic lubricants pose potential human health risks which vary from person to person. As a precaution, exposure to liquids, vapors, mists, or fumes should be minimized.

EFFECTS OF OVEREXPOSURE (Signs and symptoms of exposure):

Prolonged or repeated skin contact with this product tends to remove skin oil possibly leading to irritation and dermatitis; however, based on human experience and available toxicological data, this product is judged to be neither a "corrosive" nor an "irritant" by OSHA criteria. Product contact in the eye may cause irritation.

Product has a low order of oral and dermal toxicity. Possible aspiration hazard. Induced vomiting may cause aspiration of product into the lungs. (See Emergency First Aid Section).

PHYSICAL DATA

The following data are approximate or typical values and should not be used for precise design purposes.

BOILING RANGE:

Wide range

VAPOR PRESSURE:

< 0.1 @ 38°C/100°F

SPECIFIC GRAVITY (25°C/25°C):

(WATER = 1)

< 1.0

VAPOR DENSITY (AIR = 1):

> 8

MOLECULAR WEIGHT:

Wide range

PERCENT VOLATILE BY VOLUME:

Negligible

EVAPORATION RATE @ 1 ATM. AND 25°C

(77°F) (n-BUTYL ACETATE = 1):

< 1.0

SOLUBILITY IN WATER @ 1 ATM. and 25°C

(77°F):

Negligible

POUR, CONGEALING OR MELTING POINT:

n/e

FREEZING POINT:

n/e

REACTIVITY

This product is stable and will NOT react violently with water. Hazardous polymerization will not occur. Avoid contact with strong oxidants such as

REACTIVITY

liquid chlorine, concentrated oxygen, sodium hypochlorite or calcium hypochlorite.

DECOMPOSITION PRODUCTS UNDER FIRE CONDITIONS:

Fumes, smoke, carbon monoxide and other decomposition products, in case of incomplete combustion.

CONDITIONS TO AVOID:

Open flames.

TOXICITY

ORAL (Acute)	LD 50 > 5 g/kg (total body weight)
DERMAL (Acute)	LD 50 > 3.16 g/kg (total body weight)
EYE	N/E
INHALATION (Acute)	N/E
CHRONIC, SUBCHRONIC, ETC.	N/E

Medical Conditions Aggravated by Exposure: Unknown

This product does NOT contain any ingredients identified as carcinogenic by IRAC, NTP, or OSHA.

SARA Section 313 Status:

This material is not known to contain any chemicals on the SARA Section 313 list at a concentration greater than 1.0 percent or carcinogenic chemical on that list at a concentration greater than 0.1 percent.

SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED:

Keep product out of sewers and watercourses by diking or impounding. Absorb with sand or inert material. Sweep or scoop up and remove. Prevent spread of spill. Advise authorities if product has entered or may enter sewers, watercourses or extensive land areas. Assure conformity with local regulations.

WASTE DISPOSAL METHOD: (Consult federal, state, or local authorities for proper disposal procedures.)

Assure conformity with applicable disposal regulations. Dispose of absorbed material at an approved waste site or facility.

PROTECTION AND PRECAUTIONS

VENTILATION: (Always maintain below permissible exposure limits.)

Use local exhaust to capture vapor, mist or fumes, if necessary. Provide greater than 60 feet per minute hood face velocity for confined spaces. Provide ventilation sufficient to prevent exceeding recommended exposure limit or buildup of explosive concentrations of vapor in air.

RESPIRATORY PROTECTION: (Use only NIOSH approved equipment.)

Normally not needed at ambient temperatures. Use supplied air respiratory protection in confined or enclosed spaces, if needed. Use filter, dust, fum

PROTECTION AND PRECAUTIONS

or mist respirator type under misting conditions. Use can or cartridge, gas or vapor respirator type under conditions exceeding TWA standard.

PROTECTIVE GLOVES:

Use chemical-resistant gloves, if needed, to avoid prolonged or repeated skin contact.

EYE PROTECTION:

Use splash goggles or face shield when eye contact may occur.

OTHER PROTECTIVE EQUIPMENT:

Use chemical-resistant apron or other impervious clothing, if needed, to avoid contaminating regular clothing which could result in prolonged or repeated skin contact.

WORK PRACTICES/ENGINEERING CONTROLS:

Keep containers closed when not in use. Do not handle near heat, sparks, fire or strong oxidants.

PERSONAL HYGIENE:

Minimize breathing vapor, mist, or fumes. Avoid prolonged or repeated contact with skin. Remove contaminated clothing; launder or dry-clean before reuse. Remove contaminated shoes and thoroughly clean before reuse; discard if oil-soaked. Cleanse skin thoroughly after contact, before breaks and meals, and at end of work period. Product is readily removed from skin by waterless hand cleaners followed by washing thoroughly with soap and water.

PREPARED BY: Dave Townsend Product Safety Manager

THE ABOVE INFORMATION IS ACCURATE TO THE BEST OF OUR KNOWLEDGE. HOWEVER, SINCE DATA, SAFETY STANDARDS, AND GOVERNMENT REGULATIONS ARE SUBJECT TO CHANGE AND THE CONDITIONS OF HANDLING AND USE, OR MISUSE ARE BEYOND OUR CONTROL, SELLER MAKES NO WARRANTY, EITHER EXPRESS OR IMPLIED, WITH RESPECT TO THE COMPLETENESS OR CONTINUING ACCURACY OF THE INFORMATION CONTAINED HEREIN AND DISCLAIMS ALL LIABILITY FOR RELIANCE THEREON. USER SHOULD SATISFY HIMSELF THAT HE HAS ALL CURRENT DATA RELEVANT TO HIS PARTICULAR USE.

DEXTER WATER MANAGEMENT SYSTEMS DIVISION
THE DEXTER CORPORATION
P.O. BOX 200
THAGRI FALLS, OH 44022
(216) 247-5000

CERRO COPPER PRODUCTS COMPANY
MSDS NUMBER - CCPC-00-0306

EXPIRATION DATE: _____
REVISION: _____
DATE: _____

FOR SALES OFFICE OR PRODUCT LITERATURE CALL (800) 669-0053

FOR MEDICAL EMERGENCY, CALL COLLECT (216) 835-7233

MATERIAL SAFETY DATA SHEET

PAGE 1 OF 4

SECTION I: PRODUCT IDENTIFICATION

579

TRADE NAME: MOGUL 50232
CHEMICAL NAME: DIETHYLDITHIOCARBAMATE
CHEMICAL FAMILY: WATER CLARIFYING TREATMENT

SECTION II: HAZARDOUS INGREDIENTS

	CAS #	%	TLV/PEL
306 SODIUM DIMETHYLDITHIOCARBAMATE	128-04-1	35-45	NOT EST.

SECTION III: PHYSICAL DATA

BOILING POINT (F):	>212	SPECIFIC GRAVITY:	1.13
VAPOR PRESSURE (MM HG):	NA	PERCENT VOLATILE BY VOLUME:	60
VAPOR DENSITY (AIR=1):	NA	EVAP. RATE (WATER=1):	LIKE WATER
SOLUBILITY IN WATER:	COMPLETE	PH:	11.0 - 13.0
DENSITY:	9.3 LBS/GAL	PH (1% SOLN.):	9.0 -10.0
APPEARANCE AND ODCR:	YELLOW-GREEN SOLUTION. SLIGHT SULFIDE ODCR.		

SECTION IV: FIRE PROTECTION INFORMATION

FLASH POINT: >200 F PENSKEY-MARTENS
FLAMMABLE LIMITS: NA
EXTINGUISHING MEDIA: WATER, CARBON DIOXIDE, DRY CHEMICAL OR FCAM.

SPECIAL FIRE FIGHTING PROCEDURES: KEEP DRUMS THAT ARE EXPOSED TO FIRE COOL W/ WATER. WEAR PROTECTIVE CLOTHING AND SCBA.

UNUSUAL FIRE AND EXPLOSION HAZARDS: MAY RELEASE TOXIC GASES ON DECOMPOSITION.

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) RATING (IN FIRE CONDITIONS):
TOXICITY: 2 FIRE: 0 REACTIVITY: 0 SPECIAL: -

HAZARD RATING: 4=EXTREME 3=HIGH 2=MODERATE 1=SLIGHT 0=INSIGNIFICANT

DATE: 1/90

SECTION V: HEALTH HAZARD INFORMATION

PRIMARY ROUTE(S) OF ENTRY:

SKIN: X EYE: X INHALATION: X INGESTION: X

ACUTE EFFECTS OF EXPOSURE:

MAY IRRITATE OR DAMAGE EYES, SKIN AND MUCCUS MEMBRANES. INGESTION MAY CAUSE NAUSEA AND VOMITING.

ORAL LD50 RAT FOR 100% ACTIVE IS 1G/KG.

CHRONIC EFFECTS OF EXPOSURE:

NO KNOWN CHRONIC HEALTH EFFECTS. NOT A SUSPECTED OR CONFIRMED CARCINOGEN. (REFERENCE TO OSHA, NTP, IARC)

MEDICAL CONDITIONS WHICH MAY BE AGGRAVATED BY HANDLING THIS PRODUCT:
PERSONS WITH IMPAIRED BREATHING MAY BE AT INCREASED RISK IF CONCENTRATED MISTS ARE INHALED. OPEN WOUNDS, RASHES OR SORES MAY BE IRRITATED.

EMERGENCY AND FIRST AID PROCEDURES:

SKIN: FLUSH WITH WATER. THEN WASH THOROUGHLY WITH SOAP AND WATER.

EYES: FLUSH WITH WATER FOR 15 MINUTES AND SEEK MEDICAL ATTENTION.

INGESTION: DRINK PLENTY OF WATER AND CALL COLLECT (216)835-7233 OR CONSULT
PHYSICIAN IMMEDIATELY. AVOID ALCOHOLIC BEVERAGES. DO NOT GIVE
ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON.

INHALATION: MOVE VICTIM TO FRESH AIR. SEEK MEDICAL ATTENTION IF BREATHING
DIFFICULTY PERSISTS. APPLY ARTIFICIAL RESPIRATION IF NECESSARY.

FOR 24 HOUR EMERGENCY MEDICAL INFORMATION CALL COLLECT (216)835-7233 (TEL-SAFE

FOR ADDITIONAL NON-EMERGENCY INFORMATION CALL: SAFETY AND REGULATORY DEPT.

DEXTER WATER MANAGEMENT SYSTEM

P.O. BOX 200

CHAGRIN FALLS, OH 44022

(216) 247-5000

DATE: 1/90

=====

SECTION VI: REACTIVITY DATA

STABLE: YES: X NO: HAZARDOUS POLYMERIZATION: YES: NO: X

CONDITIONS TO AVOID:

ACIDIFICATION RELEASES FLAMMABLE GASES.

MATERIALS TO AVOID:

MINERAL ACIDS SUCH AS SULFURIC, NITRIC, AND HYDROCHLORIC, OR OXIDIZING AGENTS.

HAZARDOUS DECOMPOSITION PRODUCTS:

THERMAL DECOMPOSITION MAY PRODUCE CARBON MONOXIDE, CARBON DIOXIDE AND/OR NITROGEN OXIDES AS WELL AS AMINES AND CARBON DISULFIDE. DIMETHYLNITROSAMINES MAY BE PRODUCED ON CONTACT WITH A COMBINATION OF STRONG ACIDS AND NITROSATING COMPOUNDS.

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SECTION VII: SPILL OR LEAK PROCEDURES/WASTE DISPOSAL

SPILL OR LEAK PROCEDURES:

CONTAIN SPILL IF WITHOUT RISK. ABSORB SPILL ON INERT MATERIAL AND PLACE IN DRUMS FOR PROPER DISPOSAL. DO NOT DISCHARGE TO OPEN WATERS. USE CAUTION IN CLEAN-UP AS THE FLOOR WILL BE SLIPPERY.

WASTE DISPOSAL:

NOT A RCRA HAZARDOUS WASTE IF THE PH IS WITHIN THE RANGE OF 2.1-12.4 AT THE TIME OF DISPOSAL. DISPOSE OF IN ACCORDANCE WITH LOCAL, STATE AND FEDERAL REQUIREMENTS.

ADDITIONAL REGULATORY INFORMATION:

CERCLA:

SARA TITLE III:

SEC. 313 TOXIC CHEMICAL RELEASE - THIS PRODUCT DOES NOT CONTAIN INGREDIENTS (AT 1% OR GREATER) WHICH ARE ON THE TOXIC CHEMICAL LIST.

SEC. 302-304 EXTREMELY HAZARDOUS SUBSTANCES - THIS PRODUCT DOES NOT CONTAIN INGREDIENTS ON THE EXTREMELY HAZARDOUS SUBSTANCE LIST.

SEC. 311-312 INVENTORY REPORTING, HAZARD CATEGORY - IMMEDIATE (ACUTE)

CALIFORNIA PROPOSITION 65: THIS PRODUCT DOES NOT CONTAIN INGREDIENTS KNOWN TO THE STATE OF CALIFORNIA TO CAUSE CANCER OR REPRODUCTIVE TOXICITY.

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DATE:

1/90

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SECTION VIII: OCCUPATIONAL PROTECTIVE EQUIPMENT

EYE: CHEMICAL SAFETY GLASSES OR FACE SHIELD.

RESPIRATORY: NOT REQUIRED IF ADEQUATE VENTILATION IS PROVIDED. OTHERWISE, WEAR A SCBA.

SKIN: RUBBER OR IMPERVIOUS GLOVES.

LOCAL EXHAUST: RECOMMENDED IN CONFINED SPACES. MECHANICAL EXHAUST VENTILATION SUFFICIENT TO REMOVE AIR CONTAMINANTS FROM OPERATOR'S AREA.

OTHER: RUBBER APRON IF SPLASHING LIKELY. EYE WASH AND EMERGENCY SHOWER EQUIPMENT.

=====

SECTION IX: PRECAUTIONARY MEASURES

AVOID SKIN AND EYE CONTACT. DO NOT TAKE INTERNALLY. KEEP CONTAINER CLOSED WHEN NOT IN USE. AVOID BREATHING VAPORS OR MISTS. WASH THOROUGHLY AFTER HANDLING AND BEFORE EATING, DRINKING, OR SMOKING.

REFER TO THE "MOGUL MATERIAL SAFETY DATA SHEET GLOSSARY OF TERMS" FOR ADDITIONAL INFORMATION.

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SECTION X: TRANSPORTATION INFORMATION

DOT LABEL: NA

DOT PROPER SHIPPING NAME: NA

DOT HAZARD CLASS/I.D. #: NA

U.S. SURFACE FREIGHT CLASSIFICATION: COMPCUNDS, WATER CLARIFYING, LIQUID

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SECTION XI: ADDITIONAL INFORMATION

FDA: NONE

USDA: NONE

EPA: ALL INGREDIENTS REPORTED ON TSCA INVENTORY.

AQUATIC TOXICITY: NOT TESTED

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DATE: 1/90

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MOGUL IS A REGISTERED TRADEMARK OF THE MOGUL CORPORATION, A WHOLLY OWNED SUBSIDIARY OF THE DEXTER CORPORATION, DOING BUSINESS AS DEXTER WATER MANAGEMENT SYSTEMS DIVISION.

=====

SECTION 7: HEALTH HAZARD INFORMATION

PRIMARY ROUTE(S) OF ENTRY:

SKIN: X EYE: X INHALATION: X INGESTION: X

ACUTE EFFECTS OF EXPOSURE: MAY IRRITATE SKIN, EYES AND MUCCUS MEMBRANES WITH PROLONGED CONTACT.

CHRONIC EFFECTS OF EXPOSURE: NO KNOWN CHRONIC HEALTH EFFECTS. NOT A KNOWN OR SUSPECTED CARCINOGEN. (REFERENCE NTP, IARC, OSHA)

MEDICAL CONDITIONS WHICH MAY BE AGGRAVATED BY HANDLING THIS PRODUCT: PERSONS WITH IMPAIRED BREATHING MAY BE AT INCREASED RISK IF CONCENTRATED MISTS ARE INHALED. OPEN WOUNDS, RASHES OR SORES MAY BE IRRITATED.

EMERGENCY AND FIRST AID PROCEDURES:

SKIN: FLUSH WITH WATER. THEN WASH THOROUGHLY WITH SOAP AND WATER.

EYES: FLUSH WITH WATER FOR 15 MINUTES AND SEEK MEDICAL ATTENTION IF IRRITATION PERSISTS.

INGESTION: DRINK PLENTY OF WATER AND CALL COLLECT (216)835-7233 OR CONSULT PHYSICIAN IMMEDIATELY. AVOID ALCOHOLIC BEVERAGES. DO NOT GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON.

INHALATION: MOVE VICTIM TO FRESH AIR. SEEK MEDICAL ATTENTION IF BREATHING DIFFICULTY PERSISTS. APPLY ARTIFICIAL RESPIRATION IF NECESSARY.

FOR 24 HOUR EMERGENCY MEDICAL INFORMATION CALL COLLECT (216)835-7233 (TEL-SAFE)

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FOR ADDITIONAL NON-EMERGENCY INFORMATION CALL: SAFETY AND REGULATORY DEPT.
DEXTER WATER MANAGEMENT SYSTEMS
P.O. BOX 200
CHAGRIN FALLS, OH 44022
(216) 247-5000

DATE: 8/85

=====

SECTION VI: REACTIVITY DATA

STABLE: YES: ☒ NO: ☐ HAZARDOUS POLYMERIZATION: YES: ☐ NO: ☒

CONDITIONS TO AVOID: NONE KNOWN.

MATERIALS TO AVOID: NONE KNOWN.

HAZARDOUS DECOMPOSITION PRODUCTS: NONE KNOWN.

=====

SECTION VII: SPILL OR LEAK PROCEDURES/WASTE DISPOSAL

SPILL OR LEAK PROCEDURES: WIPE UP SPILL AND FLUSH AREA WITH WATER. IF SPILL IS EXCESSIVE, DILUTE WITH WATER AND WIPE UP.

WASTE DISPOSAL: FLUSH SMALL QUANTITIES OF MATERIAL TO SANITARY SEWER WITH EXCESS WATER IF IN ACCORDANCE WITH LOCAL, STATE AND FEDERAL REGULATIONS.

ADDITIONAL REGULATORY INFORMATION:

CERCLA:

SARA TITLE III:

SEC. 313 TOXIC CHEMICAL RELEASE - THIS PRODUCT DOES NOT CONTAIN ANY INGREDIENTS AT 1% OR GREATER THAT ARE ON THE LIST OF TOXIC CHEMICALS. SEC. 302-304 EXTREMELY HAZARDOUS SUBSTANCES - THIS PRODUCT DOES NOT CONTAIN ANY INGREDIENTS ON THE EXTREMELY HAZARDOUS SUBSTANCE LIST. SEC. 311-312 INVENTORY REPORTING. HAZARD CATEGORY - IMMEDIATE (ACUTE)

CALIFORNIA PROPOSITION 65: THIS PRODUCT DOES NOT CONTAIN ANY INGREDIENTS KNOWN TO THE STATE OF CALIFORNIA TO CAUSE CANCER OR REPRODUCTIVE TOXICITY.

=====

DATE: 5/88

=====

SECTION VIII: OCCUPATIONAL PROTECTIVE EQUIPMENT

YES: CHEMICAL SAFETY GLASSES OR FACE SHIELD.

RESPIRATORY: NOT REQUIRED UNDER NORMAL CONDITIONS OF USE.

SKIN: RUBBER OR IMPERVIOUS GLOVES.

LOCAL EXHAUST: NONE REQUIRED

OTHER: RUBBER APRON IF SPLASHING LIKELY. EYE WASH AND EMERGENCY SHOWER EQUIPMENT.

=====

SECTION IX: PRECAUTIONARY MEASURES AVOID SKIN AND EYE CONTACT. DO NOT TAKE INTERNALLY. KEEP CONTAINER CLOSED WHEN NOT IN USE. AVOID BREATHING VAPORS OR MISTS. WASH THOROUGHLY AFTER HANDLING AND BEFORE EATING, DRINKING, OR SMOKING.

REFER TO THE "MOGUL MATERIAL SAFETY DATA SHEET GLOSSARY OF TERMS" FOR ADDITIONAL INFORMATION.

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SECTION X: TRANSPORTATION INFORMATION

DOT LABEL: NA

DOT PROPER SHIPPING NAME: NA

DOT HAZARD CLASS/I.D. #: NA

U.S. SURFACE FREIGHT CLASSIFICATION: NA

=====

SECTION XI: ADDITIONAL INFORMATION

FDA: NONE

USDA: NONE

EPA: ALL INGREDIENTS REPORTED ON TSCA INVENTORY.

AQUATIC TOXICITY: NOT TESTED

=====

DATE: 8/98

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DEXTER WATER MANAGEMENT SYSTEMS DIVISION THE DEXTER CORPORATION P.O. BOX 200
CHAGRIN FALLS, OH 44022 (216) 247-5000 FOR SALES OFFICE OR PRODUCT LITERATURE
CALL (800) 669-0053

OR MEDICAL EMERGENCY, CALL COLLECT (216) 835-7233

DEPT. OF LABOR PRODUCE COMPANY
MSDS NUMBER - DCPD-00-0010

PAGE 1 OF 4

SECTION I: PRODUCT IDENTIFICATION

TRADE NAME: MOGULAB NEUTRALIZING SOLUTION CHEMICAL NAME: LIQUID
MIXTURE/TESTING REAGENT CHEMICAL FAMILY: NA

SECTION II: HAZARDOUS INGREDIENTS

	CAS #	%	TLV
ISOPROPYL ALCOHOL	67-63-0	85-95	400PPM
SALICYLIC ACID	69-72-7	5-10	NOT EST.

SECTION III: PHYSICAL DATA

BOILING POINT (F):	UNKNOWN	SPECIFIC GRAVITY:	0.81
VAPOR PRESSURE (MM HG):	UNKNOWN	PERCENT VOLATILE BY VOLUME:	>90
VAPOR DENSITY (AIR=1):	UNKNOWN	EVAP. RATE (WATER=1):	UNKNOWN
SOLUBILITY IN WATER:	COMPLETE	PH:	UNKNOWN
DENSITY:	UNKNOWN	PH (1% SOLN.):	2.6
APPEARANCE AND ODOR:	CLEAR LIQUID, ALCOHOL ODOR.		

SECTION IV: FIRE PROTECTION INFORMATION

FLASH POINT: 77 F CLOSED CUP FLAMMABLE LIMITS: UNKNOWN EXTINGUISHING
MEDIA: WATER, CARBON DIOXIDE, DRY CHEMICAL OR FCAM.

SPECIAL FIRE FIGHTING PROCEDURES: WEAR PROTECTIVE CLOTHING AND SCBA.

UNUSUAL FIRE AND EXPLOSION HAZARDS: CONTACT WITH STRONG OXIDIZERS MAY CAUSE
FIRE OR EXPLOSION.

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) RATING (IN FIRE CONDITIONS):
TOXICITY: 1 FIRE: 3 REACTIVITY: 0 SPECIAL:

HAZARD RATING: 4=EXTREME 3=HIGH 2=MODERATE 1=SLIGHT 0=INSIGNIFICANT

DATE: 9/88

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SECTION V: HEALTH HAZARD INFORMATION

PRIMARY ROUTE(S) OF ENTRY:

SKIN: X EYE: X INHALATION: X INGESTION: X

ACUTE EFFECTS OF EXPOSURE: INHALATION MAY CAUSE IRRITATION OF THE NOSE AND THROAT. EXPOSURE TO HIGH CONCENTRATIONS HAS A NARCOTIC EFFECT, PRODUCING SYMPTOMS OF DROWSINESS, HEADACHE, STAGGERING, UNCONSCIOUSNESS AND POSSIBLY DEATH. INGESTION MAY CAUSE GASTROINTESTINAL PAIN, CRAMPS, NAUSEA, VOMITING AND DIARRHEA. MAY CAUSE SKIN AND EYE IRRITATION WITH POSSIBLE CORNEAL BURNS AND EYE DAMAGE.

CHRONIC EFFECTS OF EXPOSURE: PROLONGED CONTACT MAY CAUSE DERMATITIS. CENTRAL NERVOUS SYSTEM DISTURBANCES SUCH AS RAPID BREATHING, CONFUSION AND EVEN CONVULSIONS MAY DEVELOP. NOT A SUSPECTED OR CONFIRMED CARCINOGEN. (REFERENCE TO OSHA, NTP, IARC)

MEDICAL CONDITIONS WHICH MAY BE AGGRAVATED BY HANDLING THIS PRODUCT: PERSONS WITH IMPAIRED BREATHING MAY BE AT INCREASED RISK IF CONCENTRATED MISTS ARE INHALED. OPEN WOUNDS, RASHES OR SORES MAY BE IRRITATED.

EMERGENCY AND FIRST AID PROCEDURES:

SKIN: FLUSH WITH WATER. THEN WASH THOROUGHLY WITH SOAP AND WATER.

EYES: FLUSH WITH WATER FOR 15 MINUTES AND SEEK MEDICAL ATTENTION IF IRRITATION PERSISTS.

INGESTION: DRINK PLENTY OF WATER AND CALL COLLECT (216)835-7233 OR CONSULT PHYSICIAN IMMEDIATELY. AVOID ALCOHOLIC BEVERAGES. DO NOT GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON.

INHALATION: MOVE VICTIM TO FRESH AIR. SEEK MEDICAL ATTENTION IF BREATHING DIFFICULTY PERSISTS. APPLY ARTIFICIAL RESPIRATION IF NECESSARY.

FOR 24 HOUR EMERGENCY MEDICAL INFORMATION CALL COLLECT (216)835-7233 (TEL-SAFE)

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FOR ADDITIONAL NON-EMERGENCY INFORMATION CALL: SAFETY AND REGULATORY DEPT.
DEXTER WATER MANAGEMENT SYSTEMS
P.O. BOX 200
CHAGRIN FALLS, OH 44022
(216) 247-5000

DATE: 9/88

=====

SECTION VI: REACTIVITY DATA

STABLE: YES: X NO: HAZARDOUS POLYMERIZATION: YES: NO: X

CONDITIONS TO AVOID: HEAT.

MATERIALS TO AVOID: STRONG OXIDIZERS, ACIDS AND CHLORINE.

HAZARDOUS DECOMPOSITION PRODUCTS: THERMAL DECOMPOSITION MAY PRODUCE CARBON MONOXIDE AND CARBON DIOXIDE.

=====

SECTION VII: SPILL OR LEAK PROCEDURES/WASTE DISPOSAL

SPILL OR LEAK PROCEDURES: ELIMINATE SOURCES OF IGNITION. WIPE UP SMALL SPILLS AND FLUSH AREA DOWN WITH WATER.

WASTE DISPOSAL: THIS MATERIAL IS CONSIDERED A RCRA HAZARDOUS WASTE DUE TO THE CHARACTERISTIC OF IGNITABILITY. SMALL AMOUNTS MAY BE DISPOSED OF BY EVAPORATION IN A SUITABLY VENTILATED AREA FREE OF IGNITION SOURCES. LARGER AMOUNTS SHOULD BE DISPOSED OF BY A RCRA APPROVED FACILITY BY INCINERATION. INSURE COMPLIANCE WITH LOCAL, STATE AND FEDERAL REQUIREMENTS.

ADDITIONAL REGULATORY INFORMATION:

CERCLA:

SARA TITLE III:

SEC. 313 TOXIC CHEMICAL RELEASE - THIS PRODUCT DOES NOT CONTAIN INGREDIENTS (AT LEVELS OF 1% OR GREATER) ON THE LIST OF TOXIC CHEMICALS. SEC. 302-304 EXTREMELY HAZARDOUS SUBSTANCES - THIS PRODUCT DOES NOT CONTAIN ANY INGREDIENTS ON THE EXTREMELY HAZARDOUS SUBSTANCE LIST. SEC. 311-312 INVENTORY REPORTING. HAZARD CATEGORY - IMMEDIATE (ACUTE) AND DELAYED (CHRONIC).

CALIFORNIA PROPOSITION 65: THIS PRODUCT DOES NOT CONTAIN INGREDIENTS KNOWN TO THE STATE OF CALIFORNIA TO CAUSE CANCER OR REPRODUCTIVE TOXICITY.

=====

DATE: 9/85

=====

SECTION VIII: OCCUPATIONAL PROTECTIVE EQUIPMENT

YE: CHEMICAL SAFETY GLASSES OR FACE SHIELD.

RESPIRATORY: NOT REQUIRED UNDER NORMAL CONDITIONS OF USE.

SKIN: RUBBER OR IMPERVIOUS GLOVES.

LOCAL EXHAUST: NONE REQUIRED

OTHER: RUBBER APRON IF SPLASHING LIKELY. EYE WASH AND EMERGENCY SHOWER EQUIPMENT.

=====

SECTION IX: PRECAUTIONARY MEASURES AVOID SKIN AND EYE CONTACT. DO NOT TAKE INTERNALLY. KEEP CONTAINER CLOSED WHEN NOT IN USE. AVOID BREATHING VAPORS OR MISTS. WASH THOROUGHLY AFTER HANDLING AND BEFORE EATING, DRINKING, OR SMOKING.

REFER TO THE "MOGUL MATERIAL SAFETY DATA SHEET GLOSSARY OF TERMS" FOR ADDITIONAL INFORMATION.

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SECTION X: TRANSPORTATION INFORMATION

DOT LABEL: FLAMMABLE LIQUID

DOT PROPER SHIPPING NAME: ALCOHOL, N.O.S.

DOT HAZARD CLASS/I.D. #: FLAMMABLE LIQUID/UN 1987

U.S. SURFACE FREIGHT CLASSIFICATION: NA

=====

SECTION XI: ADDITIONAL INFORMATION

FDA: NONE

USDA: NONE

EPA: ALL INGREDIENTS REPORTED ON TSCA INVENTORY.

AQUATIC TOXICITY: NOT TESTED

=====

DATE: 9/88

THE INFORMATION CONTAINED HEREIN IS FURNISHED WITHOUT WARRANTY OF ANY KIND. USERS SHOULD CONSIDER THESE DATA ONLY AS A SUPPLEMENT TO OTHER INFORMATION GATHERED BY THEM AND MUST MAKE INDEPENDENT DETERMINATIONS OF THE SUITABILITY AND COMPLETENESS OF INFORMATION FROM ALL SOURCES TO ASSURE PROPER USE AND DISPOSAL OF THESE MATERIALS AND THE HEALTH OF EMPLOYEES AND CUSTOMERS.

MOGUL IS A REGISTERED TRADEMARK OF THE MOGUL CORPORATION, A WHOLLY OWNED SUBSIDIARY OF THE DEXTER CORPORATION, DOING BUSINESS AS DEXTER WATER MANAGEMENT SYSTEMS DIVISION.

DU PONT

0.122 10/1/87
DERRO COPPER PRODUCTS COMPANY
MSDS NUMBER - CCPC-00-0311ENVIRONMENTAL
SAFETY
Hazardous
Reactivity
Stability
Toxicity
Corrosivity
Flammability
Explosivity
Other

MATERIAL SAFETY DATA SHEET

IDENTIFICATION

NAME

Hydrogen Peroxide (30 to 52%) ✓

GRADEAlbone* 35, 50, 35 CG,
50 CG, 50 M; Kastone* Kastone* B;
Perone* 30 EG, 35, 50;
Tysul* 50S, WW35, WW50**CHEMICAL FAMILY**

Inorganic Peroxide

FORMULA H_2O_2 **SYNONYMS**

Peroxide

CAS REGISTRY NO.

7722-84-1

CAS NAME

Hydrogen Peroxide

TSCA INVENTORY STATUS

Reported/Included

I.D. NOS./CODES

NIOSH Registry No: MX 0900000

PRODUCT INFORMATION PHONE

(800) 441-9442

MANUFACTURER/DISTRIBUTOR

E. I. du Pont de Nemours & Co. (Inc.)

MEDICAL EMERGENCY PHONE

(800) 441-3637

ADDRESS

Wilmington, DE 19898

TRANSPORTATION EMERGENCY PHONE

CHEMTREC (800) 424-9300

PHYSICAL DATA

BOILING POINT, 760 mmHg106 to 114°C (222 to 237°F)
(See page 2 for specific grades)**MELTING POINT**

-26 to -52°C (-15 to -62°F)

SPECIFIC GRAVITY

1.1 to 1.2 (See page 2)

VAPOR PRESSURE18 to 25 mmHg at 30°C (86°F)
(See page 2)**VAPOR DENSITY**

0.8 to 1.0 (calculated)

SOLUBILITY IN WATER

100%

pH INFORMATIONApparent pH = 3.3 at
30% to 1.8 at 50%**EVAPORATION RATE (BUTYL ACETATE=1)**

>1

FORM

Liquid

APPEARANCE

Clear

*Reg. U.S. Pat. & Tm. Off., Du Pont Company. Albone^(R), Kastone^(R), Perone^(R), and Tysul^(R) Hydrogen Peroxide are made only by Du Pont.

E-91988

Date: 3/87

The data in this Material Safety Data Sheet relates only to the specific material designated herein and does not relate to use in combination with any other material or in any process.

COLOR
Colorless

ODOR
Slightly pungent, irritating

	HYDROGEN PEROXIDE CONCENTRATION			
	<u>30%</u>	<u>35%</u>	<u>40%</u>	<u>50%</u>
Boiling Point - 760 mmHg, °C	106	108	109	114
°F	222	226	228	237
Melting Point - °C	-26	-33	--	-52
°F	-15	-27	--	-62
Specific Gravity - 20°C (68°F)	1.112	1.133	1.17	1.196
Vapor Pressure - 30°C (86°F), mmHg	25	23	22	18

HAZARDOUS COMPONENTS

MATERIAL(S)

APPROXIMATE %

Hydrogen Peroxide (CAS no. 7722-84-1)	30 (Perone ^(R) 30 EG)
Hydrogen Peroxide	35 (Albone ^(R) 35, 35 CG; Perone ^(R) 35; Tysul ^(R) WW35)
Hydrogen Peroxide	40 (Kastone ^(R))
Hydrogen Peroxide	50 (Albone ^(R) 50, 50CG, 50M; Kastone ^(R) B; Perone ^(R) 50; Tysul ^(R) 50S, WW50)

NONHAZARDOUS COMPONENTS

Water (CAS No. 7732-18-5)	50-70%
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HAZARDOUS REACTIVITY

INSTABILITY

Unstable with heat or contamination; liberation of oxygen gas may result in dangerous pressures. (See "Decomposition," below).

INCOMPATIBILITY

Incompatible with cyanides, hexavalent chromium compounds, nitric acid, potassium permanganate, many other oxidizing and reducing agents, and many flammables (see "Fire and Explosion Hazards").

DECOMPOSITION

Contamination from any source may cause rapid decomposition, oxygen gas release, and dangerous pressures. May react dangerously with rust, dust, dirt, iron, copper, heavy metals or their salts (such as mercuric oxide or chloride), alkalis, and with organic materials (especially vinyl monomers).

POLYMERIZATION

Will not occur.

CARCINOGENICITY

Not listed as a carcinogen by IARC, NTP, OSHA, ACGIH, or Du Pont.

EXPOSURE LIMITS [PEL (OSHA), TLV (ACGIH), AEL (DU PONT), ETC.]

The OSHA 8-hour Time Weighted Average (TWA) and ACGIH TLV^(R)-TWA are 1 ppm, 1.4 mg/m³.

SAFETY PRECAUTIONS

Use extreme care when attempting any reactions because of fire and explosion potential (immediate or delayed). Conduct all initial experiments on a small scale and protect personnel with adequate shielding as the reactions are unpredictable, being affected by impurities, contaminants, etc. Do not get in eyes. Avoid contact with skin and clothing. Avoid contact with flammable or combustible materials. Avoid contamination from any source including metals, dust, and organic materials. Never use pressure to empty drums—container is not a pressure vessel. Wash thoroughly after handling.

FIRST AID

In case of eye contact: Immediately flush eyes with plenty of water for at least 15 minutes. Call a physician.

In case of skin contact: Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Call a physician. Wash contaminated clothing and shoes promptly and thoroughly.

If inhaled: Remove to fresh air. If not breathing, give artificial respiration, preferably mouth-to-mouth. If breathing is difficult, give oxygen. Call a physician.

If swallowed: Do not induce vomiting. Give large quantities of water. Never give anything by mouth to an unconscious person. Call a physician.

NOTE TO PHYSICIAN

If swallowed, large amounts of oxygen may be released quickly. The distention of the stomach or esophagus may be injurious. Insertion of a gastric tube may be advisable.

PROTECTION INFORMATION

GENERALLY APPLICABLE CONTROL MEASURES

Good general ventilation should be provided to keep peroxide concentrations below exposure limits.

PERSONAL PROTECTIVE EQUIPMENT

Chemical splash goggles and appropriate gloves (neoprene, butyl rubber, or vinyl) should be worn. Have available and wear as needed: hard hat with brim; rubber boots; full length face shield; rubber, neoprene, or polyethylene apron; chemical suit with hood and breathing air supply. Do not wear leather gloves or leather soled, porous, or scuffed shoes; can ignite within minutes following contact with peroxide. Clothing can also ignite quickly; Dacron^(R) polyester is recommended for clothing because it is more resistant to fire than natural fibers. Clothing fires and skin damage occur less quickly with 50% or less peroxide than with 70% material, but adequate personal protection is essential for all industrial concentrations. Protective skin creams offer no protection from hydrogen peroxide and should not be worn.

DISPOSAL INFORMATION

AQUATIC TOXICITY

The 96-hour LC50 in catfish is 37.4 mg/L.

SPILL, LEAK OR RELEASE

Comply with Federal, State, and local regulations on reporting releases of water. Flood area with water and drain to an approved chemical sewer or wastewater treatment system, including municipal sewers if approved. May be destroyed with sodium metabisulfite or sodium sulfite (1.9 lbs. SO₂ equivalent per lb. of peroxide) after diluting to 5-10% peroxide.

WASTE DISPOSAL

Comply with Federal, State and local regulations. If approved, may be diluted and drained to a municipal sewer or waste treatment plant. May be drained through a scrap metal pit (iron, copper, etc.) to reduce peroxide concentration.

FIRE AND EXPLOSION DATA

FLASH POINT Will not burn.

AUTOIGNITION TEMPERATURE
Not applicable.

AUTODECOMPOSITION TEMPERATURE
Not applicable.

EXTINGUISHING MEDIA
Flush away with water.

FLAMMABLE LIMITS IN AIR, % BY VOL.

Will not burn, but decomposition will release oxygen which will increase the explosive limits and burning rate of flammable vapors.

FIRE AND EXPLOSION HAZARDS

Strong oxidizer. Contact with clothing or combustibles may cause fire. Contact with organic liquids or vapors may cause immediate fire or explosion, especially if heated, or may result in a delayed detonation.

SPECIAL FIRE FIGHTING INSTRUCTIONS

Flood with water. Cool tanks or containers. Wear full protective clothing (rubber suit and boots) including chemical splash goggles or hood and self-contained breathing apparatus.

HEALTH HAZARD INFORMATION

PRINCIPAL HEALTH HAZARDS (Including Significant Routes, Effects, Symptoms of Over-Exposure, and Medical Conditions Aggravated by Exposure)

Causes eye burns; effects may be delayed. Causes skin irritation or burns. Causes irritation of nose, throat, and lungs. Harmful if swallowed.

Inhalation 8-hour LC50: >2000 ppm in rats (90% H₂O₂)

Skin absorption LD50: 700 mg/kg (90% H₂O₂); 9200 mg/kg (70% H₂O₂) in rabbits

Oral LD50: 75 mg/kg in rats (75% H₂O₂)

Toxic effects described in animals from short exposures include irritation and corrosion of mucosal surfaces. Tests in animals demonstrate no carcinogenic activity. Tests for mutagenic activity in bacterial or mammalian cell cultures have been inconclusive, with positive results in some studies, and negative results in others. Tests for developmental activity (effects to the fetus) in animal species have been inconclusive, with positive results in some studies, and negative results in others. Tests in animals demonstrate no reproductive toxicity.

Human health effects of overexposure may initially include: skin irritation with discomfort or rash, eye irritation with discomfort, tearing, or blurring of vision, or irritation of the upper respiratory passages. Higher exposures may lead to these effects: eye corrosion with corneal or conjunctival ulceration, skin burns or ulceration, or temporary lung irritation effects with cough, discomfort, difficulty breathing, or shortness of breath. There are inconclusive or unverified reports of human sensitization.

NPCA - HMIS RATINGS

Health	3
Flammability	0
Reactivity	2
Personal Protection	-

NEPA RATINGS

Health	2
Flammability	0
Reactivity	1
Unusual Hazards	OXY

Personal Protection rating to be supplied
by user depending on use conditions.

ADDITIONAL INFORMATION AND REFERENCES

For further information, see Du Pont Hydrogen Peroxide Storage and Handling Bulletin.

DATE OF LATEST REVISION/REVIEW: 3/87

PERSON RESPONSIBLE FOR MSDS: J. C. WATTS

Du Pont Co.
C&P Dept., Chestnut Run,
Wilmington, DE 19898
(302) 999-4946

DATE: 01/30/90
INDEX: 02900260052

ACCT: 133918-01
CAT NO: A9494

PAGE: 1

CERRO COPPER PRODUCTS COMPANY
MSDS NUMBER - CCPC-00-0017

***ACETONE**
***ACETONE**
***ACETONE**

MATERIAL SAFETY DATA SHEET

FISHER SCIENTIFIC
CHEMICAL DIVISION
1 REAGENT LANE
FAIR LAWN NJ 07410
(201) 796-7100

EMERGENCY NUMBER: (201) 796-7100
CHEMTREC ASSISTANCE: (800) 424-9300

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SUBSTANCE IDENTIFICATION

CAS-NUMBER 67-64-1

SUBSTANCE: ***ACETONE**

TRADE NAMES/SYNONYMS:

DIMETHYLFORMALDEHYDE, DIMETHYLKETAL, DIMETHYL KETONE, BETA-KETOPROPANE, PROPANONE, 2-PROPANONE, PYROACETIC ETHER, B-KETOPROPANE, RCRA U002, STCC 4908105, UN 1090, A-949, A-40, A-20, A-19, A-946, A-18, A-18-S, A-18-SK, A-11, A-11-S, A-16-P, A-16-S, C3H6O, ACC00140

CHEMICAL FAMILY:
KETONE, ALIPHATIC

MOLECULAR FORMULA: C-H3-C-O-C-H3

MOLECULAR WEIGHT: 58.08

CERCLA RATINGS (SCALE 0-3): HEALTH=1 FIRE=3 REACTIVITY=0 PERSISTENCE=0
NFPA RATINGS (SCALE 0-4): HEALTH=1 FIRE=3 REACTIVITY=0

COMPONENTS AND CONTAMINANTS

COMPONENT: ACETONE

PERCENT: 100

OTHER CONTAMINANTS: NONE

EXPOSURE LIMITS:

ACETONE:

750 PPM (1780 MG/M3) OSHA TWA, 1000 PPM (2375 MG/M3) OSHA STEL
750 PPM (1780 MG/M3) ACGIH TWA, 1000 PPM (2375 MG/M3) ACGIH STEL
250 PPM (590 MG/M3) NIOSH RECOMMENDED 10 HOUR TWA

5000 POUNDS CERCLA SECTION 103 REPORTABLE QUANTITY
SUBJECT TO SARA SECTION 313 ANNUAL TOXIC CHEMICAL RELEASE REPORTING

PHYSICAL DATA

DESCRIPTION: CLEAR, COLORLESS, VOLATILE LIQUID WITH A CHARACTERISTIC,

SWEETISH, FRAGRANT, MINT-LIKE ODOR AND PUNGENT, SWEETISH TASTE.

BOILING POINT: 133 F (56 C) MELTING POINT: -139 F (-95 C)

SPECIFIC GRAVITY: 0.7899 VOLATILITY: 100%

VAPOR PRESSURE: 180 MMHG @ 20 C EVAPORATION RATE: (BUTYL ACETATE=1) 14.4

PH: NEUTRAL IN SOLUTION SOLUBILITY IN WATER: VERY SOLUBLE

ODOR THRESHOLD: 20 PPM VAPOR DENSITY: 2.0

SOLVENT SOLUBILITY: SOLUBLE IN ETHANOL, ETHER, CHLOROFORM, BENZENE, MOST OILS, DIMETHYLFORMAMIDE

FIRE AND EXPLOSION DATA

FIRE AND EXPLOSION HAZARD:

DANGEROUS FIRE HAZARD WHEN EXPOSED TO HEAT OR FLAME.

VAPORS ARE HEAVIER THAN AIR AND MAY TRAVEL A CONSIDERABLE DISTANCE TO A SOURCE OF IGNITION AND FLASH BACK.

VAPOR-AIR MIXTURES ARE EXPLOSIVE.

FLASH POINT: -4 F (-20 C) (CC) UPPER EXPLOSIVE LIMIT: 13%

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LOWER EXPLOSIVE LIMIT: 2.5% AUTOIGNITION TEMP.: 869 F (465 C)

FLAMMABILITY CLASS(OSHA): IB

FIREFIGHTING MEDIA:
DRY CHEMICAL, CARBON DIOXIDE, HALON, WATER SPRAY OR ALCOHOL FOAM
(1987 EMERGENCY RESPONSE GUIDEBOOK, DOT P 5800.4).

FOR LARGER FIRES, USE WATER SPRAY, FOG OR ALCOHOL FOAM
(1987 EMERGENCY RESPONSE GUIDEBOOK, DOT P 5800.4).

FIREFIGHTING:
MOVE CONTAINER FROM FIRE AREA IF POSSIBLE. COOL FIRE-EXPOSED CONTAINERS WITH WATER FROM SIDE UNTIL WELL AFTER FIRE IS OUT. STAY AWAY FROM STORAGE TANK ENDS. FOR MASSIVE FIRE IN STORAGE AREA, USE UNMANNED HOSE HOLDER OR MONITOR NOZZLES. ELSE WITHDRAW FROM AREA AND LET FIRE BURN. WITHDRAW IMMEDIATELY IN CASE OF RISING SOUND FROM VENTING SAFETY DEVICE OR ANY DISCOLORATION OF STORAGE TANK DUE TO FIRE (1987 EMERGENCY RESPONSE GUIDEBOOK, DOT P 5800.4, GUIDE PAGE 26).

EXTINGUISH ONLY IF FLOW CAN BE STOPPED. USE FLOODING AMOUNTS OF WATER AS A FOG; SOLID STREAMS MAY BE INEFFECTIVE. COOL CONTAINERS WITH FLOODING AMOUNTS OF WATER FROM AS FAR A DISTANCE AS POSSIBLE. AVOID BREATHING VAPORS; KEEP UPWIND. IF FIRE IS UNCONTROLLABLE OR CONTAINERS ARE EXPOSED TO DIRECT FLAME, EVACUATE TO A RADIUS OF 1500 FEET. CONSIDER EVACUATION OF DOWNWIND AREA IF MATERIAL IS LEAKING.

WATER MAY BE INEFFECTIVE (NFPA FIRE PROTECTION GUIDE ON HAZARDOUS MATERIALS, EIGHTH EDITION).

ALCOHOL FOAM (NFPA FIRE PROTECTION GUIDE ON HAZARDOUS MATERIAL, EIGHTH EDITION).

----- TRANSPORTATION DATA

DEPARTMENT OF TRANSPORTATION HAZARD CLASSIFICATION 49CFR172.101:
FLAMMABLE LIQUID

DEPARTMENT OF TRANSPORTATION LABELING REQUIREMENTS 49CFR172.101 AND SUBPART E:
FLAMMABLE LIQUID

DEPARTMENT OF TRANSPORTATION PACKAGING REQUIREMENTS: 49CFR173.119
EXCEPTIONS: 49CFR173.118

----- TOXICITY

ACETONE:
500 PPM EYE-HUMAN IRRITATION; 395 MG OPEN SKIN-RABBIT MILD IRRITATION; 3950 UG EYE-RABBIT SEVERE IRRITATION; 20 MG/24 HOURS EYE-RABBIT MODERATE IRRITATION; 500 MG/24 HOURS SKIN-RABBIT MILD IRRITATION; 500 PPM INHALATION-HUMAN TCLO; 12000 PPM/4 HOURS INHALATION-MAN TCLO; 10 MG/M3/6 HOURS INHALATION-MAN TCLO; 440 UG/M3/6 MINUTES INHALATION-MAN TCLO; 2857 MG/KG ORAL-MAN TDLO; 1159 MG/KG UNREPORTED-MAN LDLO; 5800 MG/KG ORAL-RAT LD50; 8 GM/KG ORAL-DOG LDLO; 3000 MG/KG ORAL-MOUSE LD50; 5340 MG/KG ORAL-RABBIT LD50; 20 GM/KG SKIN-RABBIT LD50; 110 GM/M3/1 HOUR INHALATION-MOUSE LCLO; 1297 MG/KG INTRAPERITONEAL-MOUSE LD50; 8 GM/KG INTRAPERITONEAL-DOG LDLO; 500 MG/KG INTRAPERITONEAL-RAT LDLO; 1576 MG/KG INTRAVENOUS-RABBIT LDLO; 5500 MG/KG INTRAVENOUS-RAT LD50; 4 GM/KG INTRAVENOUS-MOUSE LDLO; 5000 MG/KG SUBCUTANEOUS-GUINEA PIG LDLO; 5 GM/KG SUBCUTANEOUS-DOG LDLO; MUTAGENIC DATA (RTECS); REPRODUCTIVE EFFECTS DATA (RTECS);
CARCINOGEN STATUS: NONE.
ACETONE IS A SKIN, EYE AND MUCOUS MEMBRANE IRRITANT AND CENTRAL NERVOUS SYSTEM DEPRESSANT. THE USE OF ALCOHOLIC BEVERAGES MAY ENHANCE THE TOXIC EFFECTS. PERSONS WITH CHRONIC RESPIRATORY OR SKIN DISEASES MAY BE AT AN INCREASED RISK FROM EXPOSURE.

----- HEALTH EFFECTS AND FIRST AID

INHALATION:

ACETONE:

IRRITANT/NARCOTIC. 20,000 PPM IMMEDIATELY DANGEROUS TO LIFE OR HEALTH.

ACUTE EXPOSURE- VAPOR CONCENTRATIONS AROUND 1000 PPM MAY CAUSE SLIGHT TRANSIENT IRRITATION OF THE UPPER RESPIRATORY TRACT. EXPOSURE TO 12,000 PPM HAS CAUSED THROAT IRRITATION AND CENTRAL NERVOUS SYSTEM DEPRESSION WITH WEAKNESS OF THE LEGS, HEADACHE, DIZZINESS, DROWSINESS, NAUSEA AND A GENERAL FEELING OF MALAISE. OTHER POSSIBLE EFFECTS FROM EXPOSURE TO HIGH CONCENTRATIONS INCLUDE DRYNESS OF THE MOUTH AND THROAT, INCOORDINATION OF MOTION AND SPEECH, RESTLESSNESS, ANOREXIA, VOMITING, SOMETIMES FOLLOWED BY HEMATEMESIS, HYPOTHERMIA, DYSPNEA, SLOW, IRREGULAR RESPIRATION, SLOW, WEAK PULSE, PROGRESSIVE COLLAPSE WITH STUPOR, AND IN SEVERE CASES, COMA. LIVER DAMAGE MAY BE INDICATED BY HIGH UROBILIN LEVELS AND JAUNDICE. KIDNEY DAMAGE MAY BE INDICATED BY ALBUMIN AND RED AND WHITE BLOOD CELLS IN THE URINE. BLOOD GLUCOSE LEVELS MAY BE AFFECTED AND FATAL KETOSIS IS POSSIBLE.
CHRONIC EXPOSURE- WORKERS EXPOSED TO 500 PPM/6 HOURS/6 DAYS EXPERIENCED MUCOUS MEMBRANE IRRITATION, AN UNPLEASANT SMELL, HEAVY EYES, OVERNIGHT HEADACHE, AND GENERAL WEAKNESS ACCOMPANIED BY HEMATOLOGIC CHANGES. RECOVERY OCCURRED IN SEVERAL DAYS. WORKERS EXPOSED TO 1000 PPM FOR

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3 HOURS/DAY FOR 7-15 YEARS REPORTED CHRONIC INFLAMMATION OF THE RESPIRATORY TRACT, STOMACH AND DUODENUM, DIZZINESS, LOSS OF STRENGTH, AND ASTHENIA, DROWSINESS, VERTIGO, SENSATION OF HEAT, AND COUGHING HAVE ALSO BEEN REPORTED FROM CHRONIC EXPOSURE TO LOW CONCENTRATIONS. ANIMAL STUDIES SHOW ADVERSE EFFECTS ON FERTILITY WHEN FEMALES WERE EXPOSED CHRONICALLY DURING PREGNANCY.

FIRST AID- REMOVE FROM EXPOSURE AREA TO FRESH AIR IMMEDIATELY. IF BREATHING HAS STOPPED, PERFORM ARTIFICIAL RESPIRATION. KEEP PERSON WARM AND AT REST. TREAT SYMPTOMATICALLY AND SUPPORTIVELY. GET MEDICAL ATTENTION IMMEDIATELY.

SKIN CONTACT:

ACETONE:

IRRITANT.

ACUTE EXPOSURE- CONTACT WITH THE LIQUID CAUSED MILD IRRITATION IN RABBITS. CELLULAR DAMAGE TO THE OUTER LAYERS OF THE EPITHELIUM WITH MILD EDEMA AND HYPEREMIA HAS BEEN DEMONSTRATED IN HUMANS, BUT WAS READILY REVERSIBLE. SMALL AMOUNTS MAY BE ABSORBED THROUGH INTACT SKIN.

CHRONIC EXPOSURE- REPEATED OR PROLONGED EXPOSURE MAY CAUSE DERMATITIS WITH DRYING, CRACKING, AND ERYTHEMA DUE TO THE DEFATTING ACTION. THE AMOUNT ABSORBED THROUGH THE SKIN INCREASES DIRECTLY WITH THE FREQUENCY AND EXTENT OF THE EXPOSURE. 2 OF 3 GUINEA PIGS EXPOSED BY SKIN CONTACT FOR 3 WEEKS DEVELOPED CATARACTS BY THE END OF THREE MONTHS.

FIRST AID- REMOVE CONTAMINATED CLOTHING AND SHOES IMMEDIATELY. WASH AFFECTED AREA WITH SOAP OR MILD DETERGENT AND LARGE AMOUNTS OF WATER UNTIL NO EVIDENCE OF CHEMICAL REMAINS (APPROXIMATELY 15-20 MINUTES). GET MEDICAL ATTENTION IMMEDIATELY.

EYE CONTACT:

ACETONE:

IRRITANT.

ACUTE EXPOSURE- IN HUMANS, VAPORS PRODUCE ONLY SLIGHT IRRITATION WHEN THE CONCENTRATION IS AT OR BELOW 1000 PPM. HOWEVER, HIGH VAPOR CONCENTRATIONS HAVE CAUSED CORNEAL EPITHELIAL AND CONJUNCTIVAL INJURY IN ANIMALS. LIQUID SPLASHED IN HUMAN EYES CAUSES AN IMMEDIATE STINGING SENSATION AND, IF WASHED PROMPTLY, DAMAGE ONLY TO THE CORNEAL EPITHELIUM CHARACTERIZED BY MICROSCOPIC GRAY DOTS AND A FOREIGN BODY SENSATION, WHICH HEALS COMPLETELY IN 1-2 DAYS.

CHRONIC EXPOSURE- PROLONGED OR REPEATED EXPOSURE TO THE VAPORS MAY CAUSE IRRITATION OR CONJUNCTIVITIS.

FIRST AID- WASH EYES IMMEDIATELY WITH LARGE AMOUNTS OF WATER OR NORMAL SALINE, OCCASIONALLY LIFTING UPPER AND LOWER LIDS, UNTIL NO EVIDENCE OF CHEMICAL REMAINS (APPROXIMATELY 15-20 MINUTES). GET MEDICAL ATTENTION IMMEDIATELY.

INGESTION:

ACETONE:

NARCOTIC.

ACUTE EXPOSURE- MAY CAUSE A FRUITY ODOR OF THE BREATH AND MUCOUS MEMBRANE AND GASTROENTERIC IRRITATION. IN ACUTE CASES, A LATENT PERIOD MAY BE FOLLOWED BY RESTLESSNESS AND VOMITING PROCEEDING TO HEMATEMESIS AND PROGRESSIVE COLLAPSE WITH STUPOR. HEPATORENAL LESIONS HAVE BEEN REPORTED. THE BLOOD GLUCOSE LEVEL MAY BE AFFECTED AND KETOSIS MAY BE FATAL. 10-20 MILLILITERS HAVE BEEN TOLERATED WITHOUT ILL EFFECTS. 200 MILLILITERS HAVE CAUSED STUPOR WITHIN A HALF HOUR, FLUSHED CHEEKS, SHALLOW RESPIRATION, AND COMA WHICH LASTED FOR 12 HOURS. RENAL GLUCOSURIA PERSISTED FOR 5 MONTHS. CHRONIC EXPOSURE- NO DATA AVAILABLE.

FIRST AID- IF THE PERSON IS CONSCIOUS AND NOT CONVULSING, INDUCE EMESIS BY GIVING SYRUP OF IPECAC FOLLOWED BY WATER. (IF VOMITING OCCURS KEEP THE HEAD BELOW THE HIPS TO PREVENT ASPIRATION). REPEAT IN 20 MINUTES IF NOT EFFECTIVE INITIALLY. GIVE ACTIVATED CHARCOAL. IN PATIENTS WITH DEPRESSED RESPIRATION OR IF EMESIS IS NOT PRODUCED, PERFORM GASTRIC LAVAGE CAUTIOUSLY (DREISBACH, HANDBOOK OF POISONING, 12TH ED.). TREAT SYMPTOMATICALLY AND SUPPORTIVELY. GASTRIC LAVAGE SHOULD BE PERFORMED BY QUALIFIED MEDICAL PERSONNEL. GET MEDICAL ATTENTION IMMEDIATELY.

ANTIDOTE:

NO SPECIFIC ANTIDOTE. TREAT SYMPTOMATICALLY AND SUPPORTIVELY.

REACTIVITY

REACTIVITY:

STABLE UNDER NORMAL TEMPERATURES AND PRESSURES.

INCOMPATIBILITIES:

ACETONE:

ACIDS: INCOMPATIBLE.

AMINES (ALIPHATIC): INCOMPATIBLE.

BROMINE: VIOLENT REACTION WITH EXCESS AMOUNTS OF BROMINE.

BROMINE TRIFLUORIDE: EXPLOSION ON CONTACT.

BROMOFORM: VIOLENT REACTION IN PRESENCE OF BASES (E.G. POTASSIUM HYDROXIDE).

CHLOROFORM: VIOLENT REACTION IN PRESENCE OF A BASE.

CHROMIUM TRIOXIDE: IGNITION ON CONTACT AT AMBIENT TEMPERATURE.

CHROMYL CHLORIDE: INCANDESCENT REACTION.

DIOXYGEN DIFLUORIDE + SOLID CARBON DIOXIDE: EXPLOSION AT -78 C.

HEXACHLOROMELAMINE: POSSIBLE EXPLOSION.

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HYDROGEN PEROXIDE: EXPLOSION.
NITRIC ACID: IGNITION.
NITRIC + ACETIC ACID MIXTURE: POSSIBLE EXPLOSION.
NITRIC + SULFURIC ACID MIXTURE: VIOLENT OXIDATION.
NITROSYL CHLORIDE: EXPLOSIVE REACTION.
NITROSYL PERCHLORATE: IGNITION AND EXPLOSION.
NITRYL PERCHLORATE: IGNITION AND EXPLOSION.
OXIDIZERS (STRONG): FIRE AND EXPLOSION HAZARD.
PERMONOSULFURIC ACID: EXPLOSION.
PLASTICS: INCOMPATIBLE.
PLATINUM + NITROSYL CHLORIDE: POSSIBLE EXPLOSION.
POTASSIUM-TERT-BUTOXIDE: IGNITION.
RAYON: INCOMPATIBLE.
SODIUM HYPOBROMITE: EXPLOSION.
SODIUM HYPOIODITE: POSSIBLE EXPLOSION.
SULFUR DICHLORIDE: VIOLENT REACTION.
SULFURIC ACID AND POTASSIUM BICHROMATE: IGNITION.
THIODIGLYCOL + HYDROGEN PEROXIDE: POSSIBLE EXPLOSION.
THIOTRIAZYL PERCHLORATE: POSSIBLE EXPLOSION.
1,1,1-TRICHLOROETHANE: EXOTHERMIC CONDENSATION BY A BASIC CATALYST.
TRICHLOROMELAMINE: POSSIBLE EXPLOSION.
SEE ALSO KETONES.

KETONES:

ACETALDEHYDE: VIOLENT CONDENSATION REACTION.
NITRIC ACID + HYDROGEN PEROXIDE: FORMATION OF EXPLOSIVE PRODUCT.
PERCHLORIC ACID: VIOLENT DECOMPOSITION.

DECOMPOSITION:

THERMAL DECOMPOSITION PRODUCTS MAY INCLUDE TOXIC OXIDES OF CARBON.

POLYMERIZATION:

HAZARDOUS POLYMERIZATION HAS NOT BEEN REPORTED TO OCCUR UNDER NORMAL TEMPERATURES AND PRESSURES.

STORAGE AND DISPOSAL

OBSERVE ALL FEDERAL, STATE AND LOCAL REGULATIONS WHEN STORING OR DISPOSING OF THIS SUBSTANCE. FOR ASSISTANCE, CONTACT THE DISTRICT DIRECTOR OF THE ENVIRONMENTAL PROTECTION AGENCY.

****STORAGE****

STORE IN ACCORDANCE WITH 29 CFR 1910.106.

BONDING AND GROUNDING: SUBSTANCES WITH LOW ELECTROCONDUCTIVITY, WHICH MAY BE IGNITED BY ELECTROSTATIC SPARKS, SHOULD BE STORED IN CONTAINERS WHICH MEET THE BONDING AND GROUNDING GUIDELINES SPECIFIED IN NFPA 77-1983, RECOMMENDED PRACTICE ON STATIC ELECTRICITY.

STORE AWAY FROM INCOMPATIBLE SUBSTANCES.

****DISPOSAL****

DISPOSAL MUST BE IN ACCORDANCE WITH STANDARDS APPLICABLE TO GENERATORS OF HAZARDOUS WASTE, 40CFR 262, EPA HAZARDOUS WASTE NUMBER U002.

CONDITIONS TO AVOID

AVOID CONTACT WITH HEAT, SPARKS, FLAMES, OR OTHER SOURCES OF IGNITION. VAPORS MAY BE EXPLOSIVE AND POISONOUS; DO NOT ALLOW UNNECESSARY PERSONNEL. DO NOT OVERHEAT CONTAINERS; CONTAINERS MAY VIOLENTLY RUPTURE AND TRAVEL A CONSIDERABLE DISTANCE IN HEAT OF FIRE.

SPILL AND LEAK PROCEDURES

OCCUPATIONAL SPILL:

SHUT OFF IGNITION SOURCES. STOP LEAK IF YOU CAN DO IT WITHOUT RISK. USE WATER SPRAY TO REDUCE VAPORS. FOR SMALL SPILLS, TAKE UP WITH SAND OR OTHER ABSORBENT MATERIAL AND PLACE INTO CONTAINERS FOR LATER DISPOSAL. FOR LARGER SPILLS, DIKE FAR AHEAD OF SPILL FOR LATER DISPOSAL. NO SMOKING, FLAMES OR FLARES IN HAZARD AREA! KEEP UNNECESSARY PEOPLE AWAY; ISOLATE HAZARD AREA AND DENY ENTRY.

REPORTABLE QUANTITY (RQ): 5000 POUNDS

THE SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT (SARA) SECTION 304 REQUIRES THAT A RELEASE EQUAL TO OR GREATER THAN THE REPORTABLE QUANTITY FOR THIS SUBSTANCE BE IMMEDIATELY REPORTED TO THE LOCAL EMERGENCY PLANNING COMMITTEE AND THE STATE EMERGENCY RESPONSE COMMISSION (40 CFR 355.40). IF THE RELEASE OF THIS SUBSTANCE IS REPORTABLE UNDER CERCLA SECTION 103, THE NATIONAL RESPONSE CENTER MUST BE NOTIFIED IMMEDIATELY AT (800) 424-8802 OR (202) 426-2675 IN THE METROPOLITAN WASHINGTON, D.C. AREA (40 CFR 302.6).

PROTECTIVE EQUIPMENT

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VENTILATION:
PROVIDE GENERAL DILUTION VENTILATION TO MEET PUBLISHED EXPOSURE LIMITS.

RESPIRATOR:
THE FOLLOWING RESPIRATORS AND MAXIMUM USE CONCENTRATIONS ARE RECOMMENDATIONS BY THE U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES, NIOSH POCKET GUIDE TO CHEMICAL HAZARDS, NIOSH CRITERIA DOCUMENTS OR BY THE U.S. DEPARTMENT OF LABOR, 29CFR1910 SUBPART Z.
THE SPECIFIC RESPIRATOR SELECTED MUST BE BASED ON CONTAMINATION LEVELS FOUND IN THE WORK PLACE, MUST NOT EXCEED THE WORKING LIMITS OF THE RESPIRATOR AND BE JOINTLY APPROVED BY THE NATIONAL INSTITUTE FOR OCCUPATIONAL SAFETY AND HEALTH AND THE MINE SAFETY AND HEALTH ADMINISTRATION (NIOSH-MSHA).

1000 PPM- ANY CHEMICAL CARTRIDGE RESPIRATOR WITH ORGANIC VAPOR CARTRIDGE(S).
ANY POWERED AIR-PURIFYING RESPIRATOR WITH ORGANIC VAPOR CARTRIDGE(S).
ANY SUPPLIED-AIR RESPIRATOR.
ANY SELF-CONTAINED BREATHING APPARATUS.

6250 PPM- ANY SUPPLIED-AIR RESPIRATOR OPERATED IN A CONTINUOUS FLOW MODE.

12,500 PPM- ANY AIR-PURIFYING FULL FACEPIECE RESPIRATOR (GAS MASK) WITH A CHIN-STYLE OR FRONT- OR BACK-MOUNTED ORGANIC VAPOR CANISTER.
ANY SUPPLIED-AIR RESPIRATOR WITH A FULL FACEPIECE.
ANY SELF-CONTAINED BREATHING APPARATUS WITH A FULL FACEPIECE.

20,000 PPM- ANY SUPPLIED-AIR RESPIRATOR WITH A FULL FACEPIECE AND OPERATED IN A PRESSURE-DEMAND OR OTHER POSITIVE PRESSURE MODE.

ESCAPE- ANY AIR-PURIFYING FULL FACEPIECE RESPIRATOR (GAS MASK) WITH A CHIN-STYLE OR FRONT- OR BACK-MOUNTED ORGANIC VAPOR CANISTER.
ANY APPROPRIATE ESCAPE-TYPE SELF-CONTAINED BREATHING APPARATUS.

FOR FIREFIGHTING AND OTHER IMMEDIATELY DANGEROUS TO LIFE OR HEALTH CONDITIONS:

SELF-CONTAINED BREATHING APPARATUS WITH FULL FACEPIECE OPERATED IN PRESSURE DEMAND OR OTHER POSITIVE PRESSURE MODE.

SUPPLIED-AIR RESPIRATOR WITH FULL FACEPIECE AND OPERATED IN PRESSURE-DEMAND OR OTHER POSITIVE PRESSURE MODE IN COMBINATION WITH AN AUXILIARY SELF-CONTAINED BREATHING APPARATUS OPERATED IN PRESSURE-DEMAND OR OTHER POSITIVE PRESSURE MODE.

CLOTHING:
EMPLOYEE MUST WEAR APPROPRIATE PROTECTIVE (IMPERVIOUS) CLOTHING AND EQUIPMENT TO PREVENT REPEATED OR PROLONGED SKIN CONTACT WITH THIS SUBSTANCE.

GLOVES:
EMPLOYEE MUST WEAR APPROPRIATE PROTECTIVE GLOVES TO PREVENT CONTACT WITH THIS SUBSTANCE.

EYE PROTECTION:
EMPLOYEE MUST WEAR SPLASH-PROOF OR DUST-RESISTANT SAFETY GOGGLES TO PREVENT EYE CONTACT WITH THIS SUBSTANCE.

EMERGENCY EYE WASH: WHERE THERE IS ANY POSSIBILITY THAT AN EMPLOYEE'S EYES MAY BE EXPOSED TO THIS SUBSTANCE, THE EMPLOYER SHOULD PROVIDE AN EYE WASH FOUNTAIN WITHIN THE IMMEDIATE WORK AREA FOR EMERGENCY USE.

AUTHORIZED - FISHER SCIENTIFIC, INC.
CREATION DATE: 09/06/84 REVISION DATE: 10/13/89

-ADDITIONAL INFORMATION-
THIS INFORMATION IS BELIEVED TO BE ACCURATE AND REPRESENTS THE BEST INFORMATION CURRENTLY AVAILABLE TO US. HOWEVER, WE MAKE NO WARRANTY OF MERCHANTABILITY OR ANY OTHER WARRANTY, EXPRESS OR IMPLIED, WITH RESPECT TO SUCH INFORMATION, AND WE ASSUME NO LIABILITY RESULTING FROM ITS USE. USERS SHOULD MAKE THEIR OWN INVESTIGATIONS TO DETERMINE THE SUITABILITY OF THE INFORMATION FOR THEIR PARTICULAR PURPOSES.

MA:

SECTION 1.

Product Identification

Manufacturer: General Refractories Co.
Address: 600 Grant St., Room 3000, Pittsburgh, PA 15219
Main Telephone Number: 412-562-6000
Emergency Telephone Number: 215-666-4868
Product Name, Sales Name or Trade Name: DIBOND 60R
Product Type: Magnesite-Chromite Refractory

SECTION 2:

Hazardous Ingredients

Chemical Name	Common Name	CAS Number	Per Cent**	OSHA PEL	ACGIH TLV	Carcinogen (Y/N)*
Ferro-chromite (FeCr2O4)		12737-27-8	<25.0	(1)	(1)	No
Calcium Silicate (Ca2SiO4)		10034-77-2	<1.5	50 MPPCF	30 MPPCF	No

Note: (1) Contains Cr(III) which is not listed as hazardous by NOISH/OSHA. ACGIH TLV for Cr(III) is 0.5 mg/m³. The main ingredient in this product is sinter MgO which is not hazardous.

*Per NTP, IARC or OSHA lists. **On Phase Basis. ***Total Basis.

SECTION 3.

Physical Data

Appearance: Brown-Black Brick Shape	Odor: Odorless
Specific Gravity: 3.10-3.25	Melting Point: Over 2200°C
Boiling Point: NI	Vapor Pressure: NI
Evaporation Rate: NI	Solubility in H2O: Insoluble
Solubility in Alcohol: Insoluble	Other Solvents: Strong Acids
Percent Volatile by Vol.: NI	Vapor Density: NI

SECTION 4.

Fire and Explosion Hazard Data

Flash Point (Method used): Nonflammable
Flammable Limits: LEL NA UEL NA
Extinguishing Media: NA
Special Fire Fighting Procedures: NA
Unusual Fire and Explosion Hazards: NA

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SECTION 5. Health Hazard Data

Primary Routes of Entry	Exposure Symptoms	Emergency Procedures
Inhalation	Cough, impaired pulm. func. if exposed to dust	Move to fresh air.
Ingestion	NE	NE
Skin Contact and Absorption	Irritation	Wash with water.
Eyes	Irritation	Flush with water.
Other Potential Health Risks	NE	NE

SECTION 6. Potential Exposure

When	Hazard Form
Installation	Dust generated during mixing.
Removal	Dust from tear-out after service.

SECTION 7. Corrosivity and Reactivity Data

Stability: Stable

Incompatibility (materials to avoid): None

Decomposition Products: None

Conditions to be Avoided: None

SECTION 8. Disposal Procedures

Spill or Leak Procedures: Clean up like any solid material.

Waste Disposal Method: Approved landfill in accordance with all federal,
state and local regulations.

SECTION 9. Personal Protective Equipment/Procedures

Respiratory Protection: Yes

Type: NIOSH/OSHA approved
dust mask.

Ventilation--Local: Yes

Mechanical(General): During handling (cutting of brick or discharging the bags).

Other: NA

Protective Gloves: Non-porous gloves

Eye Protection: Safety glasses

Other Equipment: Steel toe shoes

Action to be Taken During Repair and Maintenance of Equipment that has been in Contact with this Product: Use Recommended Safety Equipment.

SECTION 10. Special Precautions

During Storage: None

Other: None

SECTION 11. Preparation/Revision

Date: 9/16/85

NA=Not Applicable

NI=No Information or Test Data

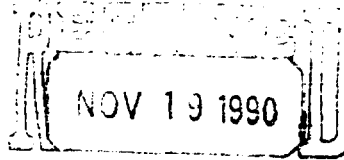
NE=Not Established



GENERAL REFRACTORIES COMPANY

Customer:

Cerro Copper Products
PO Box 66800
St. Louis, MO
(For Sauget, IL)



Date: 11/14/90

E & E AFFAIRS
63166

Dear Customer,

This product contains a toxic chemical or chemicals as listed on MSDS form attached. It is subject to the reporting requirements of section 313-Title-111 of the superfund amendments and reauthorization act of 1986 and 40 CFR Part 372.

Product: Dibond 60R & SK-Dibond 60R

MSDS413

MATERIAL SAFETY DATA SHEET

SECTION 1.

Product Identification

Manufacturer: General Refractories Co.
Address: 600 Grant St., Room 3000, Pittsburgh, PA 15219
Main Telephone Number: 412-562-6000
Emergency Telephone Number: 215-666-4858
Product Name, Sales Name or Trade Name: GREFCHEM 60 R
Product Type: Magnesite-Chromite Refractories

SECTION 2.

Hazardous Ingredients

Chemical Name	Common Name	CAS Number	Per Cent**	OSHA PEL	ACGIH TLV	Carcinogen (Y/N)*
Ferro-chromite	(FeCr2O4)	12737-27-8	<20.0	(1)	(1)	No
Calcium Silicate	(Ca2SiO4)	10034-77-2	<1.5	50 MPPCF	30 MPPCF	No

Note: (1) Contains Cr(III) which is not listed as hazardous by NIOSH/OSHA. ACGIH TLV for Cr(III) is 0.5 mg/m3. The main ingredient in this product is sinter MgO which is not hazardous.

*Per NTP, IARC or OSHA lists. **On Phase Basis. ***Total Basis.

SECTION 3.

Physical Data

Appearance: Brown-Black Brick Shape	Odor: Odorless
Specific Gravity: 3.10-3.25	Melting Point: Over 2200°C
Boiling Point: NI	Vapor Pressure: NI
Evaporation Rate: NI	Solubility in H2O: Insoluble
Solubility in Alcohol: Insoluble	Other Solvents: Strong acids
Percent Volatile by Vol.: NI	Vapor Density: NI

SECTION 4.

Fire and Explosion Hazard Data

Flash Point (Method used): Nonflammable
Flammable Limits: LEL NA UEL NA
Extinguishing Media: Nonflammable
Special Fire Fighting Procedures: None
Unusual Fire and Explosion Hazards: None

Health Hazard Data

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Potential Exposure

Corrosivity and Reactivity Data

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C

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Disposal Procedures

We

Waste Disposal Method: Approved landfill in accordance with all federal.

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SECTION 9. Personal Protective Equipment/Procedures

Respiratory Protection: Yes

Type: NIOSH approved dust
respirator.

Ventilation--Local: NA

Mechanical(General): During handling, cutting, etc. -

Other: NA

Protective Gloves: Non-porous gloves.

Eye Protection: Safety glasses or goggles.

Other Equipment: Steel toe shoes.

Action to be Taken During Repair and Maintenance of Equipment that has
been in Contact with this Product: Regular clean up.**SECTION 10. Special Precautions**

During Storage: None

Other: None

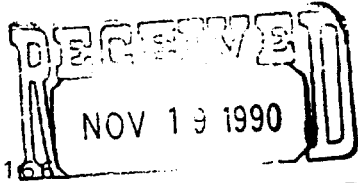
SECTION 11. Preparation/Revision
-----Date: 11/14/85



GENERAL REFRACTORIES COMPANY

Customer:

Cerro Copper Products
PO Box 66800
St. Louis, MO 63166
(For Sauget, IL)



Date: 11/14/90

Dear Customer,

This product contains a toxic chemical or chemicals as listed on MSDS form attached. It is subject to the reporting requirements of section 313-Title-111 of the superfund amendments and reauthorization act of 1986 and 40 CFR Part 372.

Product: Grefchem 60R & SK-Grefchem 60R

Sincerely Yours
General Refractories Co.

Barney D. Fowler
Manager Personnel & Safety

Notice: This Notification Must not be detached from the MSDS. Any copying and Distribution of this MSDS must include this notification.

MATERIAL SAFETY DATA SHEET

DATE OF PRINTING: 05/15/89

CERRO COPPER PRODUCTS COMPANY

MSDS NUMBER - CCPC-00-0300

SECTION I

MANUFACTURER: GLYPTAL, INC.
305 EASTERN AVE
CHELSEA, MA 02150
TELEPHONE: 617-884-6918
PRODUCT CLASS: AIR DRY ENAMEL
CODE IDENTIFICATION: 1201
TRADE NAME: GLYPTAL

HMIS 2 3 0

SECTION II - HAZARDOUS INGREDIENTS

INGREDIENT	PERCENT BY WEIGHT	ACGIH TLV PPM	OSHA PEL mg/cu.m. PPM
XYLENE	34.3	100	100
CAS NUMBER 1330-20-7			
HMIS HEALTH=1 FLAMMABILITY=3 REACTIVITY=0			
XYLOL			
VM&P NAPHTHA	5.6	300	
CAS NUMBER 8030-30-6			
HMIS HEALTH=2 FLAMMABILITY=3 REACTIVITY=0			
ALIPHATIC HYDROCARBON			
STODDARD SOLVENT	0.2	500	
CAS NUMBER 64741-41-9			
HMIS HEALTH=2 FLAMMABILITY=2 REACTIVITY=0			
HYDROCARBON MIXTURE			

N/A MEANS NOT AVAILABLE N/EST MEANS NOT ESTABLISHED
NOT EST. means NOT ESTABLISHED
NOT EST. means NOT ESTABLISHED
N/A MEANS NOT AVAILABLE NOT EST MEANS NOT ESTABLISHED

SECTION III - PHYSICAL DATA

BOILING RANGE: 250.0 TO 284.0 F VAPOR DENSITY: HEAVIER THAN AIR
EVAPORATION RATE: SLOWER THAN ETHER
PERCENT VOLATILE BY VOLUME: 54.5 VOC (less water): 3.91 LBS/GAL
WEIGHT PER GALLON: 9.75 POUNDS
VAPOR PRESSURE: NOT AVAILABLE MELTING POINT: NOT APPLICABLE
SOLUBILITY IN WATER: NEGLIGIBLE
APPEARANCE AND ODOR: RED LIQUID WITH PAINT ODOR

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

OSHA CATEGORY: FLAMMABLE LIQUID

FLASH POINT: 72 F PENSKEY MARTIN LEL: 1.0 UEL: N/AV
EXTINGUISHING MEDIA:
Carbon dioxide, dry chemical or foam
UNUSUAL FIRE AND EXPLOSION HAZARDS:
Pressure may build up in closed containers that are exposed to heat.

Solvent vapors are heavier than air and may travel a considerable distance along the ground to an ignition source and "flash back".

SPECIAL FIRE FIGHTING PROCEDURES:

- Water may be ineffective, however, water may be used to cool closed containers that are exposed to heat. Firefighting personnel should wear self-contained breathing apparatus.

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SECTION V - HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE: SEE SECTION II

PRIMARY ROUTE(S) OF ENTRY:

Inhalation and skin contact

EFFECTS OF OVEREXPOSURE:

Headache, nausea, dizziness, confusion, irritability.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE:

Respiratory difficulties or preexisting skin sensitization.

CARCINOGENICITY:

None of the components of this product are reported carcinogens.

EMERGENCY FIRST AID PROCEDURES:

INHALATION: Remove to fresh air. Administer artificial respiration or oxygen if breathing is difficult.

SKIN: Wash affected area with soap and water. Remove and launder contaminated clothing. Consult a physician if irritation persists.

EYES: Flush immediately with large amounts of water for at least 15 minutes. Take to a physician for medical treatment.

INGESTION: Call a physician immediately.

ACUTE: Skin and eye contact: Primary irritation.

CHRONIC: Xylene contained in this material has been found to cause the following effects in laboratory animals: anemia, liver abnormalities, liver and eye damage.

=====

SECTION VI - REACTIVITY DATA

STABILITY: NORMAL STABLE

CONDITIONS TO AVOID:

None known

INCOMPATIBILITY (Materials to avoid)

Strong acids and bases

HAZARDOUS DECOMPOSITION PRODUCTS:

BY FIRE: Normal products of incomplete combustion.

HAZARDOUS POLYMERIZATION: DOES NOT OCCUR

CONDITIONS TO AVOID:

None known

=====

SECTION VII - SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED:

Provide adequate ventilation. Remove all possible ignition sources.

Absorb and dispose using non-sparking tools.

Eliminate all sources of ignition. Evacuate unprotected personnel. Water spray may be used. To contain run-off, cover with an absorbent material

place in containers for proper disposal. Flush area with water to remove residue.

WASTE DISPOSAL METHOD:

Dispose in accordance with local applicable regulations. Dispose of using an approved incineration process or in accordance with local, state, and federal regulations regarding health and pollution.

=====

SECTION VIII - SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION:

In outdoor or open areas use Bureau of Mines approved mechanical filter respirator to remove solid airborne particulates of overspray. Indoors, where ventilation is inadequate, use Bureau of Mines approved chemical-mechanical respirators designed to remove both particulate and vapor.

VENTILATION:**PROTECTIVE GLOVES:**

Recommended if skin contact is likely.

EYE PROTECTION:

Chemical splash goggles recommended if potential for splash or eye contact is likely.

OTHER PROTECTIVE EQUIPMENT:

Recommended as needed to avoid contact.

SECTION IX - SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING OR STORING:

Store in a cool dry place away from heat, sparks and open flame. Keep containers closed and upright to prevent leakage. Outside or detached storage is preferred. Inside storage should be in a standard flammable liquid storeroom or cabinet. Metal containers should be grounded when transferring material from one container to another. Do not reuse product container for any purpose.

OTHER PRECAUTIONS:

PREPARED BY: TECHNICAL STAFF

REFERENCE DATE: 01/26/89

THE INFORMATION AND RECOMMENDATIONS CONTAINED HEREIN ARE BASED UPON DATA BELIEVED TO BE CORRECT. HOWEVER, NO GUARANTEE OR WARRANTY OF ANY KIND, EXPRESSED OR IMPLIED, IS MADE WITH RESPECT TO THE INFORMATION ABOVE.

WHOM IT MAY CONCERN: EFFECTIVE JAN 1, 1989, WE ARE REQUIRED BY SARA TITLE III SECTION 313 OF THE RIGHT TO KNOW LEGISLATION, TO INFORM YOU OF THE PERCENTAGE OF ANY INGREDIENT IN A PRODUCT WHICH IS IN THE 313 LIST OR AS AN LISTING AS A COMPONENT OF A MATERIAL WHICH IS IN A CATEGORY OF CHEMICAL LIST.

PRODUCT: 1201 GLYPTAL

34.3% XYLENE (CAS NUMBER 1330-20-7)

IF YOU WILL MULTIPLY YOUR TOTAL PURCHASES FROM US AS WELL AS FROM OTHER SUPPLIERS BY THE PERCENTAGE OF EACH INGREDIENT FOUND IN EACH PRODUCT AND IF THE TOTAL QUANTITY EXCEEDS THE REPORTABLE QUANTITY FOR THAT INGREDIENT YOU ARE REQUIRED TO FILE FORM R REPORTS.

MATERIAL 5

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INTERCHEM. INC. ST. LOUIS, MO. 63107 EMERGENCY PHONE: (314)436-1300

EFFECTIVE DATE: 5-13-88

PRODUCT CODE: 113

PRODUCT NAME: XXXXXXXXXXXXXXXXXXXX CERRO TUBE CLR. MSD: 113-1

<u>HAZARDOUS INGREDIENTS (TYPICAL VALUES -- NOT SPECIFICATION)</u>		<u>%</u>	<u>%</u>
GLYCOL ETHER			: 10-20%
MONOETHANOLAMINE			8-15%

Section 1

Physical Data

<u>Boiling Point:</u> 275 deg. F.	<u>Sol. In Water:</u> COMPLETE
<u>Vap. Press. (mmHg @ 25°C):</u> NA	<u>Sp. Gravity (25/25°C):</u> .977
<u>Vap. Density (Air = 1):</u> NA	<u>% Volatile by Volume:</u> 100% inclg. H2O

Appearance and Odor: CLEAR LIQUID. WATER-LIKE VISCOSITY. ETHEREAL ODOR.

Section 2

Fire and Explosion Hazard Data

<u>Flash Point:</u> NONE	<u>Flammable Limits:</u>
<u>Method Used:</u> TCC	<u>LFL (% Vol):</u> NA <u>UFL (% Vol):</u> NA

Extinguishing Media: USE MEDIA SUITABLE FOR SURROUNDING FIRE.

Special Fire Fighting Equipment and Hazards: NONE KNOWN.

Section 3

Reactivity Data

Stability: STABLE

Incompatibility: STRONG ACIDS AND OXIDIZERS.

Hazardous Decomposition Products: WHEN EXPOSED TO EXTREMELY HIGH TEMPERATURES CARBON DIOXIDE AND CARBON MONOXIDE MAY BE GIVEN OFF.

Hazardous Polymerization: WILL NOT OCCUR.

Section 4

Spill, Leakage, and Disposal Procedures

Action to be taken for Spills (Use Appropriate Safety Equipment): ABSORB WITH INERT MATERIAL AND FLUSH REMAINDER WITH LARGE AMOUNTS OF WATER.

Disposal Method: CONSULT FEDERAL, STATE AND LOCAL AUTHORITIES.

MATERIAL SAFETY DATA SHEET

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INTERCHEM. INC. ST. LOUIS, MO. 63107 EMERGENCY PHONE: (314)436-1300

EFFECTIVE DATE: 5-13-88

PRODUCT CODE: 113

PRODUCT NAME:



Cerro Tube Liner MSD: 113-1

Section 5

Health Hazard Data -- Effect of Overexposure

Ingestion: MAY CAUSE MODERATE TO SEVERE GASTROINTESTINAL IRRITATION DEPENDING UPON AMOUNT INGESTED. MAY CAUSE BURNS TO MOUTH, THROAT, STOMACH, ETC.

Eye Contact: MAY CAUSE MODERATE TO SEVERE EYE IRRITATION AND IRRITATION OF SURROUNDING TISSUE.

Skin Contact: MAY CAUSE MODERATE SKIN IRRITATION. REDNESS. DRYING. ITCHING. ETC.

Skin Absorption: WILL NOT OCCUR.

Inhalation: EXCESSIVE INHALATION FROM IMPROPER VENTILATION MAY CAUSE NAUSEA. DIZZINESS.

Section 6

First Aid

Eyes: FLUSH WITH LARGE AMOUNTS OF WATER FOR AT LEAST 15 MINUTES WHILE HOLDING UPPER AND LOWER LIDS OPEN. GET MEDICAL ATTENTION.

Skin: FLUSH WITH LARGE AMOUNT OF WATER. APPLY A MOISTURIZING SKIN LOTION. IF IRRITATION IS EVIDENT GET MEDICAL ATTENTION.

Inhalation: REMOVE PERSON TO FRESH AIR. IF BREATHING IS DIFFICULT ADMINISTER OXYGEN. GET MEDICAL ATTENTION.

Ingestion: DRINK 2 GLASSES OF WATER OR MILK AND INDUCE VOMITING BY TOUCHING FINGER TO BACK OF THROAT. KEEP HEAD BELOW HIPS TO PREVENT ASPIRATION OF MATERIAL INTO LUNGS. GET MEDICAL ATTENTION.

NOTE TO PHYSICIAN:

Eyes:

Skin:

Respiratory:

Oral:

Systemic:

MATERIAL SAFETY DATA SHEET

Page:

INTERCHEM, INC. ST. LOUIS, MO. 63107 EMERGENCY PHONE: (314)436-1300

EFFECTIVE DATE: 5-13-88

PRODUCT CODE: 113

PRODUCT NAME:



Cerro Tube CNR. MSD: 113-1

Section 7

Special Handling Information

Ventilation: NORMAL ROOM VENTILATION IS ADEQUATE.

Respiratory Protection: NONE REQUIRED FOR NORMAL USE.

Protective Clothing: WEAR CHEMICAL RESISTANT GLOVES WHEN HANDLING CONCENTRATE. IF EXCESSIVE EXPOSURE IS EXPECTED WEAR CHEMICAL RESISTANT CLOTHING AND BOOTS.

Eye Protection: SAFETY GLASSES WITH SPLASH GUARDS OR CHEMICAL SPLASH GOGGLES SHOULD BE WORN WHEN HANDLING CONCENTRATE.

Section 8

Special Precautions and Additional Information

Precautions to be Taken in Handling and Storage: TREAT EMPTY CONTAINERS AS IF THEY WERE FULL DUE TO PRESENCE OF PRODUCT RESIDUE. STORE CONTAINERS AWAY FROM HEAT AND KEEP TIGHTLY CLOSED.

Additional Information:

CONSULT INTERCHEM, INC. FOR FURTHER INFORMATION.

THE INFORMATION GIVEN HEREIN IS PROVIDED IN GOOD FAITH. HOWEVER, NO WARRANTY, EXPRESSED OR IMPLIED, IS MADE.

MATERIAL SAFETY DATA SHEET

APPROVALS:
ENVIRONMENTAL: _____
SAFETY: _____
LEGAL: _____

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INTERCHEM, INC. ST. LOUIS, MO. 63107 EMERGENCY PHONE: (314)436-1300

EFFECTIVE DATE: 8-3-89

PRODUCT CODE: 240

PRODUCT NAME: "FORMULA 600 CLEANER/DEGREASER"

MFD: 240-1

HAZARDOUS INGREDIENTS (TYPICAL VALUES -- NOT SPECIFICATION)

SODIUM METASILICATE	: 1-5% :
ETHYLENE GLYCOL MONOBUTYL ETHER	: 5-10% :
SODIUM HYDROXIDE	: 2-5% :

Section 1Physical DataBoiling Point: 200-225 F.Sol. In Water: COMPLETEVap. Press. (mmHg @ 25°C): NASp. Gravity (25/25°C): 1.0542Vap. Density (Air = 1): NA% Volatile by Volume: 85.2% incldg. H2OAppearance and Odor: CLEAR, FLUORESCENT GREEN LIQUID. WATER-LIKE VISCOSITY. LOW ODOR.Section 2Fire and Explosion Hazard DataFlash Point: NONEFlammable Limits:Method Used: TCCLFL (% Vol): NA UFL (% Vol): NAExtinguishing Media: USE MEDIA SUITABLE FOR SURROUNDING FIRE.Special Fire Fighting Equipment and Hazards: NONE KNOWN.Section 3Reactivity DataStability: STABLEIncompatibility: STRONG ACIDS AND OXIDIZERS.Hazardous Decomposition Products: CARBON DIOXIDE, CARBON MONOXIDE WHEN EXPOSED TO EXTREMELY HIGH TEMPERATURES.Hazardous Polymerization: WILL NOT OCCUR.Section 4Spill, Leakage, and Disposal ProceduresAction to be taken for Spills (Use Appropriate Safety Equipment): FLUSH WITH LARGE AMOUNTS OF WATER.Disposal Method: CONSULT FEDERAL, STATE AND LOCAL REGULATIONS.

MATERIAL SAFETY DATA SHEET

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INTERCHEM, INC. ST. LOUIS, MO. 63107 EMERGENCY PHONE: (314)436-1300

EFFECTIVE DATE: 8-3-89B

PRODUCT CODE: 240

PRODUCT NAME: "FORMULA 600 CLEANER/DEGREASER"

MSD: 240-1

Section 5

Health Hazard Data -- Effect of Overexposure

Ingestion: MAY CAUSE MODERATE TO SEVERE GASTROINTESTINAL IRRITATION DEPENDING UPON AMOUNT INGESTED.

Eye Contact: MAY CAUSE MODERATE TO SEVERE EYE IRRITATION AND IRRITATION OF SURROUNDING TISSUE.

Skin Contact: MAY CAUSE MODERATE SKIN IRRITATION, REDNESS, DRYNESS, ITCHING.

Skin Absorption: WILL NOT OCCUR.

Inhalation: EXCESSIVE INHALATION OF VAPORS IN ENCLOSED AREA MAY CAUSE NAUSEA, DIZZINESS.

Section 6

First Aid

Eyes: FLUSH WITH LARGE AMOUNTS OF WATER FOR AT LEAST 15 MINUTES WHILE HOLDING UPPER AND LOWER LIDS OPEN. GET MEDICAL ATTENTION.

Skin: FLUSH WITH LARGE AMOUNT OF WATER. APPLY MOISTURIZING SKIN LOTION. IF IRRITATION IS EVIDENT GET MEDICAL ATTENTION.

MATERIAL SAFETY DATA SHEET

Page: 3

INTERCHEM, INC. ST. LOUIS, MO. 63107 EMERGENCY PHONE: (314) 436-1300

EFFECTIVE DATE: 8-3-89

PRODUCT CODE: 240

PRODUCT NAME: "FORMULA 600 CLEANER/DEGREASER"

MSD: 240-1

Section 7

Special Handling Information

Ventilation: NORMAL ROOM VENTILATION IS ADEQUATE.

Respiratory Protection: NONE REQUIRED FOR NORMAL USE.

Protective Clothing: WEAR CHEMICAL-RESISTANT GLOVES.

Eye Protection: SAFETY GLASSES OR CHEMICAL SPLASH GOGGLES.

Section 8

Special Precautions and Additional Information

Precautions to be Taken in Handling and Storage: TREAT EMPTY CONTAINERS AS IF THEY WERE FULL DUE TO PRESENCE OF PRODUCT RESIDUE.

Additional Information:

CONSULT INTERCHEM, INC. FOR FURTHER INFORMATION.

THE INFORMATION GIVEN HEREIN IS PROVIDED IN GOOD FAITH. HOWEVER, NO WARRANTY, EXPRESSED OR IMPLIED, IS MADE.

DESCRIPTION

A heavy-duty, industrial strength cleaner-degreaser designed for the removal of grease, oil and carbonized grease from concrete, brick, quarry tile, terrazzo, plastic and many metal surfaces. Contains emulsifiers, alkaline builders and degreasers for fast action even at high dilutions.

- Non-Flammable.
- Non-Corrosive.
- Phosphate Free.
- Solventized for Fast Action.
- Non-Toxic.
- Biodegradable.

Precautions should be taken before using on glass surfaces, painted surfaces, resilient tile and aluminum or magnesium. Experiment with various dilutions in an inconspicuous area before using product on these surfaces.

PRECAUTIONARY STATEMENTS

WARNING!

CONTAINS SODIUM HYDROXIDE
AND 2-BUTOXYETHANOL.

Avoid contact with eyes and skin by wearing chemical splash goggles, chemical resistant gloves and clothing when handling concentrate. Do not take internally. Avoid prolonged breathing of vapors of sprayed product. Use only in well ventilated areas.

CONSULT OSHA MATERIAL SAFETY DATA SHEET
BEFORE USING THIS PRODUCT.

Formula 600

HEAVY DUTY DEGREASER

FOR INDUSTRIAL AND INSTITUTIONAL USE ONLY

Warning!

ALKALINE MATERIAL. MAY CAUSE EYE AND SKIN
IRRITATION. HARMFUL IF SWALLOWED.

KEEP OUT OF THE REACH OF CHILDREN

(See Additional Precautions on Side Panel)



Manufactured by

Interchem inc.

3516 N. 14th Street ■ St. Louis, Mo. 63107

314-436-1300

DIRECTIONS FOR USE

Dilutions may vary according to severity of soil, type of surface to be cleaned, cleaning method used and other factors. Therefore, the following dilutions are given as a general guideline only. The user should experiment with various dilutions to find the one most effective and economical.

LIGHT SOIL: Dilute with 256 parts water (½ oz. per gallon). Daily floor maintenance, pressure washing, etc.

MEDIUM SOIL: Dilute with 64 parts water (2 oz. per gallon). Walls, appliances, range hoods, etc.

HEAVY SOIL: Dilute with 16 parts water (8 oz. per gallon). Oil and grease build-ups on machinery, periodic cleaning of corners, etc.

For carbonized grease or oil, or aged build-ups use in a 1:1 dilution.

Apply with a conventional sprayer, with mop or by flooding. Rinse with clear water.

FIRST AID

EYES: Flush with water for at least 15 minutes while holding upper and lower lids open. Get medical attention. **SKIN:** Rinse thoroughly with water followed by a neutralizer or vinegar. **INTERNAL:** Do not induce vomiting. Drink 2 glasses of water followed by fruit juice. Get medical attention immediately.

CONSULT OSHA MATERIAL SAFETY DATA SHEET
BEFORE USING THIS PRODUCT.

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MATERIAL SA

Page: 1

INTERCHEM, INC. ST. LOUIS, MO. 63107 EMERGENCY PHONE: (314)436-1300

EFFECTIVE DATE: 3-7-88

PRODUCT CODE: 201

PRODUCT NAME: FORMULA 700

MSD: 201-4

HAZARDOUS INGREDIENTS (TYPICAL VALUES -- NOT SPECIFICATION)

SODIUM METASILICATE

: 1-5% :

VARIOUS SURFACTANTS

: 1-5% :

Section 1

Physical Data

Boiling Point: 200-225 F.

Sol. In Water: COMPLETE

Vap. Press. (mmHg @ 25°C): NA

Sp. Gravity (@25/25°C): 1.012

Vap. Density (Air = 1): NA

% Volatile by Volume: 95.7% incldg. H₂O

Appearance and Odor: CLEAR, BLUE LIQUID. WATER-LIKE VISCOSITY. LOW ODOR.

Section 2

Fire and Explosion Hazard Data

Flash Point: NONE

Flammable Limits:

Method Used: TCC

LFL (% Vol): NA UFL (% Vol): NA

Extinguishing Media: USE MEDIA SUITABLE FOR SURROUNDING FIRE.

Special Fire Fighting Equipment and Hazards: NONE KNOWN.

Section 3

Reactivity Data

Stability: STABLE

Incompatibility: STRONG ACIDS AND OXIDIZERS.

Hazardous Decomposition Products: CARBON DIOXIDE, CARBON MONOXIDE WHEN EXPOSED TO EXTREMELY HIGH TEMPERATURES.

Hazardous Polymerization: WILL NOT OCCUR.

Section 4

Spill, Leakage, and Disposal Procedures

Action to be taken for Spills (Use Appropriate Safety Equipment): FLUSH WITH LARGE AMOUNTS OF WATER.

Disposal Method: CONSULT FEDERAL, STATE AND LOCAL REGULATIONS.

MATERIAL SAFETY DATA SHEET

Page: 2

INTERCHEM. INC. ST. LOUIS, MO. 63107 EMERGENCY PHONE: (314)436-1300

EFFECTIVE DATE: 3-7-88

PRODUCT CODE: 201

PRODUCT NAME: FORMULA 700

MSD: 201-1

Section 5

Health Hazard Data -- Effect of Overexposure

Ingestion: MAY CAUSE MODERATE TO SEVERE GASTROINTESTINAL IRRITATION DEPENDING UPON AMOUNT INGESTED.

Eye Contact: MAY CAUSE MODERATE EYE IRRITATION AND IRRITATION OF SURROUNDING TISSUE.

Skin Contact: MAY CAUSE MODERATE SKIN IRRITATION, REDNESS, DRYNESS, ITCHING.

Skin Absorption: WILL NOT OCCUR.

Inhalation: EXCESSIVE INHALATION MAY CAUSE NAUSEA, DIZZINESS.

Section 6

First Aid

Eyes: FLUSH WITH LARGE AMOUNTS OF WATER FOR AT LEAST 15 MINUTES WHILE HOLDING UPPER AND LOWER LIDS OPEN. GET MEDICAL ATTENTION.

Skin: FLUSH WITH LARGE AMOUNT OF WATER. APPLY MOISTURIZING SKIN LOTION. IF IRRITATION IS EVIDENT GET MEDICAL ATTENTION.

Inhalation: REMOVE PERSON TO FRESH AIR. IF BREATHING IS DIFFICULT ADMINISTER OXYGEN. GET MEDICAL ATTENTION.

Ingestion: DRINK 2 GLASSES OF WATER OR MILK AND INDUCE VOMITING BY TOUCHING FINGER TO BACK OF THROAT. KEEP HEAD BELOW HIPS TO PREVENT ASPIRATION OF MATERIAL INTO LUNGS. GET MEDICAL ATTENTION.

NOTE TO PHYSICIAN:

Eyes:

Skin:

Respiratory:

Oral:

Systemic:

MATERIAL SAFETY DATA SHEET

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INTERCHEM, INC. ST. LOUIS, MO. 63107 EMERGENCY PHONE: (314)436-1300

EFFECTIVE DATE: 3-7-88

PRODUCT CODE: 201

PRODUCT NAME: FORMULA 700

MSD: 201-4

Section 7

Special Handling Information

Ventilation: NORMAL ROOM VENTILATION IS ADEQUATE.

Respiratory Protection: NONE REQUIRED FOR NORMAL USE.

Protective Clothing: WEAR CHEMICAL-RESISTANT GLOVES.

Eye Protection: SAFETY GLASSES OR CHEMICAL SPLASH GOGGLES.

Section 8

Special Precautions and Additional Information

Precautions to be Taken in Handling and Storage: TREAT EMPTY CONTAINERS AS IF THEY WERE FULL DUE TO PRESENCE OF PRODUCT RESIDUE.

Additional Information:

CONSULT INTERCHEM, INC. FOR FURTHER INFORMATION.

THE INFORMATION GIVEN HEREIN IS PROVIDED IN GOOD FAITH. HOWEVER, NO WARRANTY, EXPRESSED OR IMPLIED, IS MADE.



DIRECTIONS:

Floors, Walls and Appliances: Apply a 1:15 dilution. Let stand 30 seconds, then wipe off.

Washable Fabrics: Apply concentrate to stain, add garment to washload.

Ovens, Barbeques, Range hoods and Ventilators: Cold: apply 1:1 dilution with water, let stand 5 minutes, flush away. Where a hot solution (150° F) can be applied, use at a 1:4 dilution. Let set 5 minutes, then wipe off.

Flooring, Ducts, Grills, Light Fixtures and Walls: Use a 1:15 dilution.

Ceramic Tile and Porcelain: Use a 1:15 dilution for tubs, floors and lavatories.

Dewaxing: Apply a 1:4 dilution, let soak 5-10 minutes, scrub and rinse away.

WARNING:

KEEP OUT OF REACH OF CHILDREN.

Contains metasilicate. Concentrate may be harmful if swallowed; may cause burns of the eye and skin.

FIRST AID: Contact — flush affected areas with free flowing water, then wash with vinegar or dilute boric acid solution. Ingestion — administer acid fruit juices or slightly diluted vinegar, follow with a dose of milk. Call a physician.

Formula 700

LIQUID ALL PURPOSE CLEANER

WARNING: KEEP OUT OF REACH OF CHILDREN
See Side Panel for Additional Information

For Institutional and Industrial use only

Manufactured By

Interchem inc.

3516 N. 14th Street ■ St. Louis, Mo. 63107

Area Code 314 436-1300

A HEAVY DUTY, ALL PURPOSE, INDUSTRIAL STRENGTH CLEANER FOR REMOVING CARBONIZED GREASE AND OIL, INK, GUM AND SOAP SCUMS. MAY BE USED ON CEMENT, QUARRY TILE, TERRAZZO, PLASTIC AND METAL SURFACES.

- SOLVENTIZED FOR FAST ACTION
- NON-FLAMMABLE
- NON-TOXIC
- CAN BE SPRAYED, MOPPED OR WIPE ON
- FREE RINSING
- LEAVES STAINLESS STEEL SPARKLING
- CLEANS VENTILATORS
- DEGREASES KITCHEN SURFACES
- ERADICATES HEEL, CRAYON AND LIPSTICK MARKS
- DISSOLVES WAX BUILD-UPS
- ACTS AS A LAUNDRY AID
- DEWAXES RESILIENT AND MINERAL FLOORS

MATERIAL

ENVIRONMENTAL

Page: 1

INTERCHEM. INC. ST. LOUIS, MO. 63107 EMERGENCY PHONE: (314) 439-1300

EFFECTIVE DATE: 7-20-89

PRODUCT CODE: 760

PRODUCT NAME: "ORANGE CLEANER-DEGREASER" 760 1

MSD: 760-1

HAZARDOUS INGREDIENTS (TYPICAL VALUES -- NOT SPECIFICATION)

4-ISOPROPENYL-1-METHYLCYCLOHEXANE DISTILLATE

125-400

Section 1

Physical Data

Boiling Point: 130.0 deg. C.

Vap. Press. (mmHg @ 25°C): NA

Vap. Density (Air = 1): NA

Sol. in Water: FORMS EMULSION.

Sp. Gravity (25/25°C): .936

% Volatile by Volume: 83.25% incldg. H₂O.

Appearance and Odor: CLEAR, YELLOW OR ORANGE, LOW VISCOSITY LIQUID WITH SWEET, CITRUSY ODOR.

Section 2

Fire and Explosion Hazard Data

Flash Point: NONE

Method Used: T.C.C.

Flammable Limits:

LFL (% Vol): NA UFL (% Vol): NA

Extinguishing Media: DRY CHEMICAL, CO₂, WATER FOG, FOAM.

Special Fire Fighting Equipment and Hazards: IF LARGE AMOUNT IS INVOLVED USE NIOSH-APPROVED SELF-CONTAINED BREATHING APPARATUS OPERATED IN A POSITIVE PRESSURE MODE. COOL FIRE EXPOSED CONTAINERS WITH WATER STREAM.

Section 3

Reactivity Data

Stability: STABLE

Incompatibility: AVOID HEAT, FLAME AND CONTACT WITH STRONG OXIDIZING AGENTS.

Hazardous Decomposition Products: CARBON MONOXIDE AND UNIDENTIFIED ORGANIC COMPOUNDS MAY BE FORMED DURING COMBUSTION.

Hazardous Polymerization: WILL NOT OCCUR.

Section 4

Spill, Leakage, and Disposal Procedures

Action to be taken for Spills (Use Appropriate Safety Equipment): ABSORB WITH AN INERT MATERIAL SUCH AS CLAY OR SAND. SCOOP UP AND TRANSFER TO CONTAINERS SUITABLE FOR DISPOSAL. FLUSH RESIDUE WITH WATER.

Disposal Method: CONSULT FEDERAL, STATE AND LOCAL AUTHORITIES.

INTERCHEM, INC. ST. LOUIS, MO. 63107 EMERGENCY PHONE: (314) 436-1300

EFFECTIVE DATE: 7-20-89

PRODUCT CODE: 760

PRODUCT NAME: "ORANGE CLEANER-DEGREASER"

MSD: 760-2

Section 5Health Hazard Data -- Effect of OverexposureIngestion: VOMITING. ASPIRATION PNEUMONITIS.Eye Contact: MAY CAUSE MINIMAL IRRITATION TO EYE AND SURROUNDING TISSUE.Skin Contact: MAY CAUSE MILD SKIN IRRITATION. PROLONGED OR REPEATED EXPOSURE CAN CAUSE SKIN DEFATTING AND DRYING.Skin Absorption: WILL NOT OCCUR.Inhalation: MAY BE IRRITATING TO NOSE, THROAT AND UPPER RESPIRATORY TRACT. HIGH VAPOR CONCENTRATIONS MAY CAUSE CNS DEPRESSION.Section 6First AidEyes: FLUSH EYES WITH PLENTY OF WATER FOR AT LEAST 15 MINUTES WHILE HOLDING UPPER AND LOWER LIDS OPEN. IF IRRITATION IS EVIDENT GET MEDICAL ATTENTION.Skin: REMOVE CONTAMINATED CLOTHING. WASH EXPOSED AREA WITH PLENTY OF WATER. FOLLOW WITH WASHING WITH SOAP AND WATER. IF IRRITATION IS EVIDENT GET MEDICAL ATTENTION. LAUNDRY CONTAMINATED CLOTHING BEFORE REUSE.Inhalation: MOVE PERSON TO FRESH AIR AND ADMINISTER OXYGEN IF NECESSARY. GET MEDICAL ATTENTION.Ingestion: DO NOT INDUCE VOMITING. IF VOMITING OCCURS SPONTANEOUSLY, KEEP HEAD BELOW HIPS TO PREVENT ASPIRATION OF MATERIAL INTO LUNGS. GET MEDICAL ATTENTION.NOTE TO PHYSICIAN:Eyes:Skin:Respiratory:Oral:Systemic:

MATERIAL SAFETY DATA SHEET

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INTERCHEM, INC. ST. LOUIS, MO. 63107 EMERGENCY PHONE: (314)436-1300

EFFECTIVE DATE: 7-20-89

PRODUCT CODE: 760

PRODUCT NAME: "ORANGE CLEANER-DEGREASER"

MSD: 760-1

Section 7

Special Handling Information

Ventilation: USE MECHANICAL VENTILATION AS REQUIRED TO CONTROL VAPOR CONCENTRATIONS.

Respiratory Protection: NONE REQUIRED FOR NORMAL USE OF PRODUCT. IF OVEREXPOSURE IS EXPECTED, USE A NIOSH APPROVED RESPIRATOR.

Protective Clothing: WEAR CLOTHING APPROPRIATE TO MINIMIZE EXCESSIVE EXPOSURE TO SKIN.

Eye Protection: WEAR SAFETY GLASSES AS APPROPRIATE TO MINIMIZE EXPOSURE.

Section 8

Special Precautions and Additional Information

Precautions to be Taken in Handling and Storage: STORE AWAY FROM HEAT AND FLAME. KEEP CONTAINERS TIGHTLY CLOSED WHEN NOT IN USE. TREAT EMPTY CONTAINERS AS IF THEY WERE FULL DUE TO PRESENCE OF PRODUCT RESIDUE.

Additional Information: CONSULT INTERCHEM, INC. FOR FURTHER INFORMATION.

THE INFORMATION GIVEN HEREIN IS PROVIDED IN GOOD FAITH. HOWEVER, NO WARRANTY, EXPRESSED OR IMPLIED, IS MADE.

DESCRIPTION

An industrial strength cleaner/degreaser formulated with all natural ingredients, including 100% biodegradable surfactants and d-Limonene organic citrus solvent.

Can be safely used to clean oil, grease, dirt and grime from all types of porous and non-porous surfaces, including concrete, painted and metal surfaces, brick, tile, wood, porcelain and any surface where the use of soaps and solvents would normally be acceptable.

- 100% Biodegradable
- Fresh orange scent provides instant deodorizing
- Non-Corrosive
- Non-Combustible
- Does not contain butyl solvents, petroleum distillates, acids, alkalies, phosphates.

CAUTION

Strong solvent action may defat skin and cause irritation. May cause eye irritation. Avoid contact with skin and eyes by wearing chemical resistant gloves and splash goggles. **DO NOT TAKE INTERNALLY.** Avoid prolonged breathing of vapors in non-ventilated areas.

ORANGE


CLEANER DEGREASER

100% NATURAL

CAUTION! Do not drink this product. May cause skin irritation with prolonged or repeated contact. May cause eye irritation. See side panel for additional information.

FOR INDUSTRIAL AND INSTITUTIONAL USE ONLY

Manufactured by

 **nterchem inc.**

3516 N. 14th Street ■ St. Louis, Mo. 63107

314-436-1300

DIRECTIONS FOR USE

Apply diluted product with a cloth, mop, brush, sponge or mechanical spray device. Allow product to stand for approximately 1 minute. Agitate or scrub wet surface until all soil is completely emulsified. Rinse with clear water and let dry.

LIGHT CLEANING: Dilute 1 to 4 ounces of product with water to make 1 gallon.

MEDIUM CLEANING: Dilute 5 to 10 ounces of product with water to make 1 gallon.

HEAVY CLEANING/DEGREASING: Dilute 20 to 40 ounces of product with water to make 1 gallon.

HEAVY DEGREASING: Dilute product with equal amount of water.

CLEANING/DEODORIZING DRAINS, GREASE TRAPS, SEPTIC TANKS: Use undiluted. Pour 1 pint to 1 gallon directly in drain or trap and allow to stand for as long as possible before flushing with hot water (30 minutes minimum).

FIRST AID

SKIN: Flush with large amount of water.

EYES: Flush with large amount of water for 15 minutes, holding upper and lower eyelids open. Get medical attention. **INTERNAL:** Rinse mouth quickly and drink 2 glasses of water. Get medical attention immediately.

CONSULT MATERIAL SAFETY DATA SHEET FOR MORE INFORMATION

5/89

REVISIONS: _____
DATE: _____
BY: _____
FOR: _____

MATERIAL SAFETY DATA SHEET

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INTERCHEM, INC. ST. LOUIS, MO. 63107 EMERGENCY PHONE: (314) 435-1300

EFFECTIVE DATE: 7-20-89

PRODUCT CODE: 760A

PRODUCT NAME: "ORANGE CLEANER/DEGREASER"

760A

MSD: 760A-1

HAZARDOUS INGREDIENTS (TYPICAL VALUES -- NOT SPECIFICATION)

4-ISOPROPENYL- 1-METHYLCYCLOHEXENE	10%
ETHYLENE GLYCOL MONOBUTYL ETHER	20%
ISOPROPYL ALCOHOL 99%	18%

Section 1

Physical Data

Boiling Point: 130.0 deg.C.	Sol. In Water: FORMS EMULSION.
Vap. Press. (mm-Hg @ 25°C): NA	Sp. Gravity (25/25°C): .908
Vap. Density (Air = 1): NA	% Volatile by Volume: 90.35% incldg. H ₂ O

Appearance and Odor: CLEAR, YELLOW, LOW VISCOSITY LIQUID WITH SWEET, CITRUSY
ODOR.

Section 2

Fire and Explosion Hazard Data

Flash Point: NONE	Flammable Limits:
Method Used: T.C.C.	LFL (% Vol): NA UFL (% Vol): NA

Extinguishing Media: DRY CHEMICAL, CO₂, WATER FOG, FOAM.

Special Fire Fighting Equipment and Hazards: IF LARGE AMOUNT IS INVOLVED USE A
NIOSH-APPROVED SELF-CONTAINED BREATHING APPARATUS OPERATED IN A POSITIVE
PRESSURE MODE. COOL FIRE EXPOSED CONTAINERS WITH WATER STREAM.

Section 3

Reactivity Data

Stability: STABLE

Incompatibility: AVOID HEAT, FLAME AND CONTACT WITH STRONG OXIDIZING AGENTS.

Hazardous Decomposition Products: CARBON MONOXIDE AND UNIDENTIFIED ORGANIC
COMPOUNDS MAY BE FORMED DURING COMBUSTION.

Hazardous Polymerization: WILL NOT OCCUR.

Section 4

Spill, Leakage, and Disposal Procedures

Action to be taken for Spills (Use Appropriate Safety Equipment): ABSORB WITH AN INERT MATERIAL SUCH AS CLAY OR SAND. SCOPED UP AND TRANSFER TO CONTAINER SUITABLE FOR DISPOSAL. FLUSH RESIDUE WITH WATER.

Disposal Method: CONSULT FEDERAL, STATE AND LOCAL AUTHORITIES.

MATERIAL SAFETY DATA SHEET

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INTERCHEM, INC. ST. LOUIS, MO. 63107 EMERGENCY PHONE: (314)436-1300

EFFECTIVE DATE: 7-20-89

PRODUCT NO. 34744

PRODUCT NAME: "ORANGE CLEANER-DEGREASER"

MSD: 760P-1

Section 5

Health Hazard Data -- Effect of Overexposure

Ingestion: VOMITING. ASPIRATION PNEUMONITIS.

Eye Contact: MAY CAUSE MINIMAL IRRITATION TO EYE AND SURROUNDING TISSUE.

Skin Contact: MAY CAUSE MILD SKIN IRRITATION. PROLONGED OR REPEATED EXPOSURE CAN CAUSE SKIN DEFATTING AND DRYING.

Skin Absorption: WILL NOT OCCUR.

Inhalation: MAY BE IRRITATING TO NOSE, THROAT AND UPPER RESPIRATORY TRACT. HIGH VAPOR CONCENTRATIONS MAY CAUSE CNS DEPRESSION.

Section 6

First Aid

Eyes: FLUSH EYES WITH PLENTY OF WATER FOR AT LEAST 15 MINUTES WHILE HOLDING UPPER AND LOWER LIDS OPEN. IF IRRITATION IS EVIDENT GET MEDICAL ATTENTION.

Skin: REMOVE CONTAMINATED CLOTHING. WASH EXPOSED AREA WITH PLENTY OF WATER. FOLLOW WITH WASHING WITH SOAP AND WATER. IF IRRITATION IS EVIDENT GET MEDICAL ATTENTION. LAUNDER CONTAMINATED CLOTHING BEFORE REUSE.

Inhalation: MOVE PERSON TO FRESH AIR AND ADMINISTER OXYGEN IF NECESSARY. GET MEDICAL ATTENTION.

Ingestion: DO NOT INDUCE VOMITING. IF VOMITING OCCURS SPONTANEOUSLY, KEEP HEAD BELOW HIPS TO PREVENT ASPIRATION OF MATERIAL INTO LUNGS. GET MEDICAL ATTENTION.

NOTE TO PHYSICIAN:

Eyes:

Skin:

Respiratory:

Oral:

Systemic:

MATERIAL SAFETY DATA SHEET

Page: 2

INTERCHEM, INC. ST. LOUIS, MO. 63107 EMERGENCY P-HONE: (314) 438-1300

EFFECTIVE DATE: 7-20-89

PRODUCT CODE: 1781-

PRODUCT NAME: "ORANGE CLEANER-DEGREASER"

YSD: 760A-2

Section 7

Special Handling Information

- Ventilation: USE MECHANICAL VENTILATION AS REQUIRED TO CONTROL VAPOR CONCENTRATIONS.
- Respiratory Protection: NONE REQUIRED FOR NORMAL USE OF PRODUCT. IF OVEREXPOSURE IS EXPECTED, USE A NIOSH APPROVED RESPIRATOR.
- Protective Clothing: WEAR CLOTHING APPROPRIATE TO MINIMIZE EXCESSIVE EXPOSURE TO SKIN.
- Eye Protection: WEAR SAFETY GLASSES AS APPROPRIATE TO MINIMIZE EXPOSURE.

Section 8

Special Precautions and Additional Information

- Precautions to be Taken in Handling and Storage: STORE AWAY FROM HEAT AND FLAME. KEEP CONTAINERS TIGHTLY CLOSED WHEN NOT IN USE. TREAT EMPTY CONTAINERS AS IF THEY WERE FULL DUE TO PRESENCE OF PRODUCT RESIDUE.

Additional Information: CONSULT INTERCHEM, INC. FOR FURTHER INFORMATION.

THE INFORMATION GIVEN HEREIN IS PROVIDED IN GOOD FAITH. HOWEVER, NO WARRANTY, EXPRESSED OR IMPLIED, IS MADE.

MATERIAL :

ENVIRONMENTAL :

HAZARD :

TOXICITY :

Page: 1

INTERCHEM. INC. ST. LOUIS. MO. 63107 EMERGENCY PHONE: (314)436-1300

EFFECTIVE DATE: 2-4-88

PRODUCT CODE: 210

PRODUCT NAME: RPY 11

MSD: 210-4

HAZARDOUS INGREDIENTS (TYPICAL VALUES -- NOT SPECIFICATION)

SODIUM HYDROXIDE

1-5%

SODIUM METASILICATE

1-5%

Section 1Physical DataBoiling Point: 220 F.Sol. In Water: COMPLETEVap. Press. (mmHg @ 25°C): NASp. Gravity (@25/25°C): .992Vap. Density (Air = 1): NA% Volatile by Volume: 92.48% incldg. H2OAppearance and Odor: CLEAR, AMBER COLORED LIQUID. WATER-LIKE VISCOSITY. ETHEREAL ODOR.Section 2Fire and Explosion Hazard DataFlash Point: NONEFlammable Limits:Method Used: TCCLFL (% Vol): NAUFL (% Vol): NAExtinguishing Media: USE MEDIA SUITABLE FOR SURROUNDING FIRE.Special Fire Fighting Equipment and Hazards: NONESection 3Reactivity DataStability: STABLEIncompatibility: STRONG OXIDIZERS.Hazardous Decomposition Products: AT HIGH TEMPERATURES, CARBON DIOXIDE AND OXIDES OF SULPHUR.Hazardous Polymerization: WILL NOT OCCUR.Section 4Spill, Leakage, and Disposal ProceduresAction to be taken for Spills (Use Appropriate Safety Equipment): OBSERVE ALL HANDLING PRECAUTIONS CONTAINED IN THIS MSDS. MOP UP AS MUCH MATERIAL AS POSSIBLE. FLUSH REMAINDER WITH WATER. FOR LARGE SPILL, ABSORB WITH INERT MATERIAL AND TRANSFER TO CONTAINER SUITABLE FOR TRANSPORTATION TO DISPOSAL SITE. FLUSH RESIDUE WITH WATER.Disposal Method: CONSULT FEDERAL, STATE AND LOCAL REGULATIONS.

MATERIAL SAFETY DATA SHEET

Page: 2

INTERCHEM. INC. ST. LOUIS. MO. 63107 EMERGENCY PHONE: (314)436-1300

EFFECTIVE DATE: 8-4-98

PRODUCT CODE: 210

PRODUCT NAME: RPM II

MSD: 810-4

Section 5

Health Hazard Data -- Effect of Overexposure

Ingestion: MAY CAUSE SEVERE IRRITATION AND BURNS TO GASTROINTESTINAL TRACT.

Eye Contact: SEVERE EYE IRRITATION AND/OR EYE BURNS MAY OCCUR DUE TO ALKALINE NATURE OF MATERIAL.

Skin Contact: MODERATE TO SEVERE IRRITATION MAY OCCUR DEPENDING ON AMOUNT AND LENGTH OF EXPOSURE.

Skin Absorption: WILL NOT OCCUR.

Inhalation: NO EFFECTS LIKELY UNLESS MATERIAL IS SPRAYED OR ATOMIZED IN AREA WITH INADEQUATE VENTILATION.

Section 6

First Aid

Eyes: FLUSH IMMEDIATELY WITH LARGE AMOUNTS OF WATER FOR AT LEAST 15 MINUTES HOLDING UPPER AND LOWER EYELIDS OPEN. CALL A PHYSICIAN.

Skin: WASH WITH LARGE AMOUNT OF WATER. REMOVE CONTAMINATED CLOTHING BEFORE RE-USE. IF IRRITATION IS EVIDENT CALL A PHYSICIAN.

Inhalation: MOVE PERSON TO FRESH AIR. IF BREATHING IS DIFFICULT ADMINISTER OXYGEN. CALL A PHYSICIAN.

Ingestion: IF SIGNIFICANT AMOUNTS HAVE BEEN INGESTED CALL A PHYSICIAN IMMEDIATELY. GIVE LARGE AMOUNTS OF WATER OR MILK TO DRINK FOR DILUTION. DO NOT INDUCE VOMITING.

NOTE TO PHYSICIAN:

Eyes:

Skin:

Respiratory:

Oral:

Systemic:

MATERIAL SAFETY DATA SHEET

Page: 2

INTERCHEM, INC. ST. LOUIS, MO. 63107 EMERGENCY PHONE: (314)436-1300

EFFECTIVE DATE: 2-4-88

PRODUCT CODE: 210

PRODUCT NAME: RPY 11

YSD: 210-4

Section 7

Special Handling Information

Ventilation: LOCAL VENTILATION IS ADEQUATE FOR NORMAL USE OF PRODUCT.

Respiratory Protection: NONE REQUIRED FOR NORMAL USE.

Protective Clothing: WEAR CHEMICAL RESISTANT GLOVES SUCH AS RUBBER OR NEOPRENE AND CHEMICAL RESISTANT CLOTHING AS NECESSARY TO MINIMIZE CONTACT.

Eye Protection: SAFETY GLASSES WITH SIDE SHIELDS OR CHEMICAL SPLASH GOGGLES.

Section 8

Special Precautions and Additional Information

Precautions to be Taken in Handling and Storage: TREAT EMPTY CONTAINERS AS IF THEY WERE FULL DUE TO PRESENCE OF PRODUCT RESIDUE.

Additional Information:

CONSULT INTERCHEM, INC. FOR FURTHER INFORMATION.

THE INFORMATION GIVEN HEREIN IS PROVIDED IN GOOD FAITH. HOWEVER, NO WARRANTY, EXPRESSED OR IMPLIED, IS MADE.

M A T E R I A L S A F E T Y D A T A S H E E T

SECTION 1 PRODUCT IDENTIFICATION

Product Name: TERPENE-D

Synonyms: Orange Terpenes

Chemical Family: Solvents

SECTION 2 COMPONENTS

Ingredient(s)	CAS No.	%	PEL	TLV
4-isopropenyl-1-methylcyclohexene	5989-27-5	99%	NE	NE

SECTION 3 PHYSICAL DATA

Appearance and Odor Clear, colorless liquid with citrusy odor.	Specific Gravity 0.84 @ 25 C
Boiling Point 310 F	Vapor Density in Air (Air=1) 4.69
Vapor Pressure 1mm @ 20 C	% Volatile, by Volume 100%
Evaporation Rate Considered slow	Solubility in Water Insoluble

SECTION 4 REACTIVITY DATA

Stability Stable at room temperature

Conditions to Avoid Avoid strong oxidizing agents

Incompatibility (Materials to avoid)
Avoid strong oxidizing agents

Hazardous Decomposition Products
None Known

Hazardous Polymerization
Polymerization catalysts such as Aluminum Chloride

SECTION 5 FIRE AND EXPLOSION DATA

Flash Point (Method Used): 119 F (TCC)

Flammable Limits in Air: 302 F

Extinguishing Agents:

Dry powder, foam, CO2

Unusual Fire and Explosion Hazards:

Class B fire procedures.

Cumbustible liquid, keep from heat, sparks and open flame.

SECTION 6 TOXICITY AND FIRST AID

Exposure Limits: Harmful if swallowed. May cause eye damage. Can cause skin irritation. FEMA-GRAS; FDA-GRAS. RIFM lists acute oral LD50 (rat) >5g/kg. Acute dermal LD50 (rat) >5g/kg. Irritation-mild irritation-none in 10% petrolatum. Sensitazation-none in 10% petrolatum.

Medical Conditions Aggravated by Exposure:

May aggravate dermititis

Acute Toxicity:

Can cause eye damage and skin irritation with overexposure. Inhalation may cause nausea.

First Aid:

SKIN: Remove contaminated clothing. Wash affected area with copious amounts of soap and water.

EYES: Remove contact lenses. Flush with water X 30 min. See physician if irritation persists.

INGESTION: Do not induce vomiting. Drink milk or water to dilute. Contact physician immediately.

Chronic Toxicity:

Data not available at this time.

SECTION 7 PERSONAL PROTECTION AND CONTROLS

Respiratory Protection:

Not normally required. If vapor concentration becomes high, use self contained air mask.

Ventilation:

Local exhaust is adequate.

Skin Protection:

Standard industrial type rubber gloves.

EYE PROTECTION

Chemical splash goggles or face shield suggested.

Hygiene

Wash hands thoroughly after handling.

Other Control Measures

Usually
not required.

SECTION 8 STORAGE AND HANDLING PRECAUTIONS

Usual precautions for combustible liquids.

All handling equipment should be electrically grounded.

SECTION 9 SPILL, LEAK AND DISPOSAL PRACTICES

Steps to be taken in case material is released or spilled.

Small spills should be absorbed by dirt, sand or other suitable absorbents for disposal. Large spills can be diked with Earth, then pumped to tank truck for disposal. Clean the area with soapy water.

Waste disposal method

Disposal in landfill approved for same, away from water supplies. Burning is an alternate method. Observe local, state and federal regulations.

SECTION 10 TRANSPORTATION

DOT Hazard Classification
Combustionable liquid

Placard Required
Combustionable

Label Required
Combustionable liquid

FOR FURTHER INFORMATION CONTACT:

INTERCHEM, INC.
3516 North 14th Street
St. Louis, Missouri 63107

(314) 436-1300

Keystone Lubricants
900 E. 8TH AVENUE / SUITE 10
KING OF PRUSSIA, PA 19406

CERRO COPPER PRODUCTS COMPANY
MSDS NUMBER - COPC-00-0039

ENVIRONMENTAL: _____
HAZARD: _____
REACTIVITY: _____
CORROSIVITY: _____

REVISION DATE
03-MAY-89

DATE ISSUED
13-MAR-90

PRODUCT IDENTIFICATION

Keystone Product

PRODUCT #:

... DRAW 1575-27
7 Indicates the Percentage of Graphite)

A2A902A

CHEMICAL NAME:

CAS #'S:

Mixture of Petroleum Soap-based
Grease and Graphite

Mixture

CHEMICAL FAMILY:

SYNONYMS:

Petroleum hydrocarbon

Petroleum Based Grease

EMERGENCY TELEPHONE:

OTHER: Chemtrec

(800) 822-3659

(800) 424-9300

HAZARDOUS INGREDIENTS

COMPONENTS:

W/W

HAZARD DATA (TLV, LD50, LC50, ETC.):

Petroleum-based lubricating oil
CAS #'S 64742-53-6 or
64742-52-5

TLV 5 mg./meter cubed
(as an oil mist)

Graphite CAS # 7782-42-5

PEL 15 MPPCF

Sty acids, tallow, calcium salts
CAS # 64755-01-7

n/e

Proprietary additives

n/e

HAZARDOUS MATERIALS IDENTIFICATION SYSTEM (HMIS):

Health

Flammability

Reactivity

Basis

1

1

0

Recommended by Exxon

SHIPPING INFORMATION

TRANSPORTATION INCIDENT INFORMATION:

1. Compound or lubricant. Metal cutting, drawing or drilling.
Dry, liquid or paste. NOI

PHYSICAL PROPERTIES

The following data are approximate or typical values and should not be used
for precise design purposes.

Boiling Range:

Boiling range

VAPOR PRESSURE:

< 0.1 @ 30°C/100°F

PHYSICAL PROPERTIES

SPECIFIC GRAVITY (25°C/25°C):

1.02 = 1)

1.0

VAPOR DENSITY (AIR = 1):

> 8

MOLECULAR WEIGHT:

See range

PERCENT VOLATILE BY VOLUME:

Negligible

EVAPORATION RATE @ 1 ATM. AND 25°C

(n-BUTYL ACETATE = 1):

1.0

SOLUBILITY IN WATER @ 1 ATM. and 25°C

(77°F):

Negligible

BOILING, CONGEALING OR MELTING POINT:

FREEZING POINT:

n/e

APPEARANCE AND ODOR:

Light Gel, Petroleum Odor

FIRE AND EXPLOSION DATA

FLASH POINT (MINIMUM):

3°C (320°F) Test method: COC

AUTOIGNITION TEMPERATURE:

N/E

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA) - HAZARD IDENTIFICATION:

Health

Flammability

Reactivity

Basis

1

1

0

Recommended by Exxon

FLAMMABLE OR EXPLOSIVE LIMITS (approximate percent by volume in air):

Estimated values: lower 1%

upper 6%

EXTINGUISHING MEDIA AND FIRE FIGHTING PROCEDURES:

Water spray (fog), dry chemical, carbon dioxide and vaporizing liquid are extinguishing agents may all be suitable for extinguishing fires involving this type product, depending on size or potential size of fire and circumstances related to the situation. Plan fire protection and response strategy through consultation with local fire protection authorities or appropriate specialists.

The following procedures for this type of product are based on the recommendations in the National Fire Protection Association's "Fire Protection Code on Hazardous Materials", Eighth Edition (1984):

Use water spray, dry chemical, foam, or carbon dioxide. Water or foam may cause foaming. Use water to keep fire-exposed containers cool. Water froth may be used to flush spills away from exposure. Minimize breathing gases, vapor, fumes, or decomposition products. Use supplied-air breathing equipment for enclosed or confined spaces or as otherwise needed.

USUAL FIRE AND EXPLOSION HAZARDS:

"EMPTY" CONTAINER WARNING:

These containers retain residue (liquid or vapor) and can be dangerous. DO NOT PRESSURIZE, WELD, CUT BRAZE, SOLDER, DRILL, GRIND OR EXPOSE SUCH CONTAINERS TO HEAT, FLAME, SPARKS, OR OTHER SOURCES OF IGNITION; THEY MAY EXPLODE AND CAUSE INJURY OR DEATH. Do not attempt to clean since residue is difficult to remove. "Empty" drums should be completely drained, properly tagged, and returned to a drum reconditioner. All other containers should be disposed of in an environmentally safe manner and in accordance with

FIRE AND EXPLOSION DATA

Government regulations. For work on tanks refer to Occupational Safety and Health Administration regulations, ANSI Z49.1, and other governmental and industrial references pertaining to cleaning, repairing, welding, or other contemplated operations.

REACTIVITY DATA

This product is stable and will NOT react violently with water. Hazardous polymerization will not occur. Avoid contact with strong oxidizers such as liquid chlorine, concentrated oxygen, sodium hypochlorite or calcium hypochlorite.

DECOMPOSITION PRODUCTS UNDER FIRE CONDITIONS:

Flames, smoke, carbon monoxide and other thermal decomposition products, such as oxides of carbon in case of incomplete combustion.

CONDITIONS TO AVOID:

Open flames.

SPILL AND LEAK

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED:

Seep product out of sewers and watercourses by diking or impounding. Absorb with sand or inert material. Sweep or scoop up and remove. Prevent spread of spill. Advise authorities if product has entered or may enter sewers, watercourses or extensive land areas. Assure conformity with local regulations.

DISPOSAL METHOD: (Consult federal, state, or local authorities for proper disposal procedures.)

Assure conformity with applicable disposal regulations. Dispose of absorbed material at an approved waste site or facility.

TOXICITY

ORAL (Acute)	LD 50 > 5 g/kg (total body weight)
DERMAL (Acute)	LD 50 > 3.16 g/kg (total body weight)
INHALATION (Acute)	N/E
CHRONIC, SUBCHRONIC, ETC.	N/E

Medical Conditions Aggravated by Exposure: Unknown

This product does NOT contain any ingredients identified as carcinogenic by IARC, NTP, or OSHA.

HEALTH HAZARD INFORMATION

EXPOSURE LIMIT FOR TOTAL PRODUCT:
mg/cubic meter for oil mist in air

BASIS:
OSHA Regulation 29 CFR 1910.1000

VARIABILITY AMONG INDIVIDUALS:

Health studies have shown that many petroleum hydrocarbons and synthetic lubricants pose potential human health risks which vary from person to person.

HEALTH HAZARD INFORMATION

son. As a precaution, exposure to liquids, vapors, mists, or fumes should be minimized.

ITS OF OVEREXPOSURE (Signs and symptoms of exposure):

Prolonged or repeated skin contact with this product tends to remove skin oils possibly leading to irritation and dermatitis; however, based on human experience and available toxicological data, this product is judged to be neither a "corrosive" nor an "irritant" by OSHA criteria. Product contacting eye may cause irritation.

Product has a low order of oral and dermal toxicity. Possible aspiration hazard. Induced vomiting may cause aspiration of product into the lungs. (See Emergency First Aid Section).

CONTACT:

If splashed into the eyes, flush with clear water for 15 minutes or until irritation subsides. If irritation persists, call a physician.

SKIN CONTACT:

In case of skin contact, remove contaminated clothing and wash skin thoroughly with soap and water.

INHALATION:

Vapor pressure is very low. Vapor inhalation under ambient conditions is normally not a problem. If overcome by vapor from hot product, immediately move from exposure and call a physician. If breathing is irregular or has stopped, start resuscitation; administer oxygen if available. If overexposure to oil mist, remove from further exposure until excessive oil mist condition subsides.

INGESTION:

If ingested, do not induce vomiting. Call a physician immediately.

SPECIAL PROTECTION

VENTILATION: (Always maintain below permissible exposure limits.)

Provide local exhaust to capture vapor, mist or fumes, if necessary. Provide at least 60 feet per minute hood face velocity for confined spaces. Provide ventilation sufficient to prevent exceeding recommended exposure limit or buildup of explosive concentrations of vapor in air.

RESPIRATORY PROTECTION: (Use only NIOSH approved equipment.)

Respiratory protection is normally not needed at ambient temperatures. Use supplied air respiratory protection in confined or enclosed spaces, if needed. Use filter, dust, fume, mist respirator type under misting conditions. Use can or cartridge, gas vapor respirator type under conditions exceeding TWA standard.

PROTECTIVE GLOVES:

Use chemical-resistant gloves, if needed, to avoid prolonged or repeated skin contact.

FACE PROTECTION:

Use splash goggles or face shield when eye contact may occur.

OTHER PROTECTIVE EQUIPMENT:

Use chemical-resistant apron or other impervious clothing, if needed, to avoid contaminating regular clothing which could result in prolonged or repeated skin contact.

SPECIAL PROTECTION

WORK PRACTICES/ENGINEERING CONTROLS:

Keep containers closed when not in use. Do not handle near heat, sparks, flame, or strong oxidants.

PERSONAL HYGIENE:

Minimize breathing vapor, mist, or fumes. Avoid prolonged or repeated contact with skin. Remove contaminated clothing; launder or dry-clean before reuse. Remove contaminated shoes and thoroughly clean before reuse; discard if oil-soaked. Cleanse skin thoroughly after contact, before breaks and meals, and at end of work period. Product is readily removed from skin by waterless hand cleaners followed by washing thoroughly with soap and water.

SPECIAL PRECAUTIONS

Minimum contact with this and all chemicals is recommended as a good general policy to follow.

PREPARED BY: Percy Kanga Product Safety Manager

THE ABOVE INFORMATION IS ACCURATE TO THE BEST OF OUR KNOWLEDGE. HOWEVER, SINCE DATA, SAFETY STANDARDS, AND GOVERNMENT REGULATIONS ARE SUBJECT TO CHANGE AND THE CONDITIONS OF HANDLING AND USE, OR MISUSE ARE BEYOND OUR CONTROL, SELLER MAKES NO WARRANTY, EITHER EXPRESS OR IMPLIED, WITH RESPECT TO THE COMPLETENESS OR CONTINUING ACCURACY OF THE INFORMATION CONTAINED HEREIN AND DISCLAIMS ALL LIABILITY FOR RELIANCE THEREON. USER SHOULD SATISFY HIMSELF THAT HE HAS ALL CURRENT DATA RELEVANT TO HIS PARTICULAR USE.

Material Safety Data Sheet

Date revised: 10-16-89

LCC Code: N/A

Date entered:10-11-89

LYON CHEMICAL CO., INC.
1381 LUCILE AVENUE
MARIETTA, GA 30067

EMERGENCY PHONE:

1-800-622-1944

XX SECTION 1 XX
XXXXXXXXXXXXXXXXXXXX PRODUCT IDENTIFICATION XXXXXXXXXXXXXXXXXXXX
XX

(1.) Product name: **DEFOAMER**

CERRO COPPER PRODUCTS COMPANY
MSDS NUMBER - CCPC-00-0340

(2.) Chemical name/Synonyms: n/a

ENVIRONMENTAL, _____
 SAFETY, _____

(3.) Chemical family: DEFOAMING agent

(4.) Chemical formula: n/a

(5.) NFPA acute hazard rating:

(6.) health: 0

(7.) flammability: 0

(8.) reactivity: 0

[illegible]

Note: list all CERCLA hazardous substances at 1% or greater and carcinogens at 0.1% or greater.

(1)	(2)	(3)	(4)	(5)	(6)
Ingredient (Chemical Name)	CAS Number	Percent Range	PEL	LD ₅₀ mg/kg	Other
Contains no hazardous ingredients		100%			

[illegible]

- (1) Eye Contact: Rinse for 15 minutes with potable water. If irritation persists, seek medical attention.
- (2) Skin Contact: Rinse with water.
- (3) Inhalation: Remove victim to source of fresh air. If symptoms persist, seek medical attention.
- (4) Ingestion: Seek immediate medical attention.
- (5) Special instructions for physician: None

h

(1) Primary route(s) of entry into body:

(2) ☒ Skin absorption (3) ☐ Inhalation (4) ☐ Ingestion

(6) Eyes: Redness, watering.

(7) Skin: Redness

(8) Inhalation: Irritation.

(9) Ingestion: Nausea.

(10) Chronic effects: (include carcinogenic potential) Not known.

[illegible]

(9) Ventilation:

(2) ☒ Local exhaust (3) ☐ General exhaust (4) ☐ None required

(5) Personal protective equipment: none required

(6) Respirator type: None required

(7) Gloves: (8) Natural rubber (9) Plastic (10) Nitrile

(11) X Neoprene (12) Butyl (13) Other

(14) Eye protection: (15) X Glasses with side shields

(16) _____ Full face shield

(17) _____ Chemical splash goggles

(18) X Other: none

XX SECTION 6 XX
XX
XX

- (1) Appearance/Odor: white emulsion liquid/ No odor
(2) Physical state: (3)___Solid (4)X___Liquid (5)___Gas
(6) Boiling point: 130° F (7) Freeze point: n/a (8) Specific gravity (H₂O=1): 1.00
(9) pH (full strength): 7.0 (10) pH (dilution): 7.0 (11) Solubility in water: Complete
(12) Vapor pressure: 1.4 mm Hg. @ 25° C (13) Vapor density (air=1): 4.7
(14) Evaporation rate (water=1): 1 (15) Percent volatiles: n/a

XX SECTION 7 XX
XX
XX

- (1) Flash point: none to boil (2) Method used: T.C.C.
(3) Flammable (explosive) limits in air: not known
(4) Autoignition temperature: not known
(5) Suitable extinguishing media: n/a
(6) Hazardous combustion bi-products: None
(7) Recommended fire fighting procedures: n/a
(8) Unusual fire & explosion hazards: n/a

XX SECTION 8 XX
XX
XX

- (1) Thermal stability: (2)X___Stable (3)___Unstable
(4) Conditions to avoid: Extreme heat
(5) Hazardous decomposition products: n/a
(6) Hazardous polymerization: (7)___May occur (8)X___Will not occur
(9) Conditions to avoid: Extreme heat
(10) Incompatibility:
(11) Materials to avoid: oxidizers
(12) Corrosive action on materials: nil

ON CHEMICAL CO., INC.

PRODUCT NAME: DEFOAMER

XX SECTION 9 XX
XXXXXXXXXXXXXXXXXX STORAGE AND HANDLING PRECAUTIONS XXXXXXXXXXXXXXXX
XX

- (1) Storage: Store at temperatures below 120° F.
- (2) Handling: Wear chemical resistant gloves, apron and eye and face protection.
- (3) Precautionary labeling: n/a

XX SECTION 10 XX
XXXXXXXXXXXXXXXXXX ENVIRONMENTAL INFORMATION XXXXXXXXXXXXXXXX
XX

- (1) Spill or leak procedures:
- (2) Small spill/leak: Rinse to drain.
- (3) Large spill/leak: Mop up or absorb. Rinse to drain.
- (4) Spill reportable quantity: none
- (5) Waste disposal method (including clean-up media): Ship to
registered waste disposal site.
- (6) EPA or appropriate waste classification:
- (7) ___ RCRA or appropriate characteristic waste. If so, EPA hazardous waste No.
None
- (8) ___ RCRA or appropriate listed waste. If so, EPA hazardous waste No.
None
- (9) X_ Non-RCRA regulated waste.
- (10) Procedure for handling empty containers: rinse thoroughly
- (11) Environmental toxicity data: biodegradable
- (12) Other regulatory controls:
- (13) Is material classified under the CLEAN WATER ACT (USA) or appropriate water
regulations as a:
- (14) Toxic pollutant (section 307) ? ___ Yes X___ No
- (15) Hazardous substance (section 311) ? ___ Yes X___ No
- (16) If yes, reportable quantity (R.Q.) _____ lbs. (kgs.)

PRODUCT NAME: DEFOAMER

 Yes .X No

(19) Hazardous air pollutant (section 12) ?

 Yes X No

**XX SECTION 11 XXXXXXXXXXXXXXXXXX
TRANSPORTATION AND SHIPPING REQUIREMENTS XXXXXXXX**

X USA-DOT Europe-ADR/RID UN-IMO UN-ICAO

IATA _____ Canada-CTC _____ Other _____ none _____

(3) Hazard class: None (4) Identification No. None

(5) Labels required: _____ Flammable liquid _____ Corrosive material

Other _____ None _____

(6) Other requirements: None

[illegible]

Date revised: 5-16-88

Lyon Code: 120-693

Date entered: 5-16-88

LYON CHEMICAL CO., INC.
1391 LUCILE AVE.
MARIETTA, GA. 30067

EMERGENCY PHONE:

1-800-622-1944

XX SECTION 1 XXX
XXXXXXXXXXXXXXXXXXXXXXXXXX PRODUCT IDENTIFICATION XXXXXXXXXXXXXXXXXXXXX
XX

- (1.) Product name: **EB-24**
- (2.) Chemical name/Synonyms: n/a
- (3.) Chemical family: alkaline detergent
- (4.) Chemical formula: mixture
- (5.) NFPA acute hazard rating:

CERRO COPPER PRODUCTS COMPANY
MSDS NUMBER - CCPC-00-0341

UNIFORMED: _____
SAFETY: _____
PURCHASING: _____

(6.) health: 0 (7.) flammability: 0 (8.) reactivity: 0

XX SECTION 2 XXX
XXXXXXXXXXXXXXXXXXXXXXXXXX CHEMICAL COMPOSITION XXXXXXXXXXXXXXXXXXXXX
XX

Note: List all CERCLA hazardous substances at 1% or greater and carcinogens at 0.1% or greater.

(1) Ingredient (Chemical Name)	(2) CAS Number	(3) Percent Range	(4) PEL	(5) LD50 mg/kg	(6) Other
Sodium hydroxide	1310-73-2	<1.5 n/a	500		n/a
Ethylene diamine tetraacetate, sodium	64-02-8	<4.0 n/a	330		n/a
Monopropylene Glycol Methyl Ether	1589-49-7	<3.5 n/a	5710		n/a
Balance non-hazardous		>91.0%			

XX SECTION 3 XXX
XXXXXXXXXXXXXXXXXXXXX EMERGENCY AND FIRST AID PROCEDURES XXXXXXXXXXXXXXX
XX

- (1) Eye Contact: Rinse for 15 minutes with potable water. If irritation persists, seek medical attention.
- (2) Skin Contact: Rinse with water.
- (3) Inhalation: Remove victim to source of fresh air. If symptoms persist, seek medical attention.
- (4) Ingestion: Seek immediate medical attention.
- (5) Special instructions for physician: None

12-10-88

Handwritten signature

XX SECTION 4 XX
XXXXXXXXXXXXXXXXXXXXX PHYSIOLOGICAL EFFECTS XXXXXXXXXXXXXXXXXXXXXXXX
XX

(1) Primary route(s) of entry into body:

(2) ☒ Skin absorption (3) ☐ Inhalation (4) ☐ Ingestion

(5) Acute effects:

(6) Eyes: Blurred vision, redness, watering, burning, blistering.

(7) Skin: Redness

(8) Inhalation: Irritation, coughing.

(9) Ingestion: Burning sensation, nausea.

(10) Chronic effects: (include carcinogenic potential) Not known.

XX SECTION 5 XX
XXXXXXXXXXXXXXXXXXXXX OCCUPATIONAL CONTROL PROCEDURES XXXXXXXXXXXXXXXX
XX

(1) Ventilation:

(2) ☐ Local exhaust (3) ☐ General exhaust (4) ☒ None required

5) Personal protective equipment:

(6) Respirator type: None required

(7) Gloves: (8) ☐ Natural rubber (9) ☐ Plastic (10) ☐ Nitrile

(11) ☒ Neoprene (12) ☐ Butyl (13) ☐ Other

14) Eye protection: (15) ☒ Glasses with side shields

(16) ☐ Full face shield

(17) ☐ Chemical splash goggles

(18) ☐ Other: none

(1) Appearance/Odor: Dark brown liquid/slight ammonia odor

(2) Physical state: (3) _____ Solid (4) ☒ Liquid (5) _____ Gas

(6) Boiling point: 212° F (7) Freeze point: 32° F (8) Specific gravity. (H₂O=1): 1.1

(9) pH (full strength): 13.0 (10) pH (dilution): 11.0 (11) Solubility in water: complete

(12) Vapor pressure: 17.5 mm Hg. @ 20° C (13) Vapor density (air=1): n/a

(14) Evaporation rate (water=1): 1 (15) Percent volatiles: n/a

(1) Flash point: none
(2) Method used: C.O.C.
(3) Flammable (explosive) limits in air: n/a
(4) Autoignition temperature: n/a
(5) Suitable extinguishing media: n/a
(6) Hazardous combustion bi-products: n/a
(7) Recommended fire fighting procedures: n/a
(8) Unusual fire & explosion hazards: n/a

(1) Thermal stability: (2) ☒ Stable (3) ☐ Unstable

(4) Conditions to avoid: extreme heat

(5) Hazardous decomposition products: not known

(6) Hazardous polymerization: (7) ☐ May occur (8) ☒ Will not occur

(9) Conditions to avoid: none

(10) Incompatibility:

(11) Materials to avoid: non-ferrous metals, skin

(12) Corrosive action on materials: slight on above

- 1) Storage: Store at temperatures below 120° F.
- 2) Handling: Wear chemical resistant gloves, apron and eye and face protection.
- 3) Precautionary labeling: none

- 1) Spill or leak procedures:
 - (2) Small spill/leak: Neutralize with acid. Rinse to drain.
 - (3) Large spill/leak: Mop up or absorb. Neutralize with acid and rinse to drain.
 - (4) Spill reportable quantity: none
- 5) Waste disposal method (including clean-up media): Neutralize with acid. Ship to registered waste disposal site.
- 6) EPA or appropriate waste classification:
 - (7) ___ RCRA or appropriate characteristic waste. If so, EPA hazardous waste No. None
 - (8) ___ RCRA or appropriate listed waste. If so, EPA hazardous waste No. None
 - (9) X_ Non-RCRA regulated waste.
- 10) Procedure for handling empty containers: rinse thoroughly
- 11) Environmental toxicity data: biodegradable
- 12) Other regulatory controls:

(13) Is material classified under the CLEAN WATER ACT (USA) or appropriate water regulations as a:

(14) Toxic pollutant (section 307) ? Yes X No

(15) Hazardous substance (section 311) ? Yes ☒ No ☐

(16) If yes, reportable quantity (R.Q.) _____ lbs. (kgs.)

PRODUCT NAME EB-24

 Yes X No

(19) Hazardous air pollutant (section 12) ? Yes X No

(20) Comments: none

[illegible]

X USA-DOT Europe-ADR/RID UN-IMO UN-ICAO
IATA Canada-CTC Other none .

(3) Hazard class: none (4) Identification No. none

(5) Labels required: _____ Flammable liquid _____ Corrosive material
Other _____ none

(6) Other requirements: none

[illegible]

Material Safety Data Sheet
May be used to comply with
OSHA's Hazard Communication Standard,
29 CFR 1910.1200. Standard must be
consulted for specific requirements.

U
O
(Not for use in food)
Form Approved
OMB No. 1218-0072

IDENTITY (As Used on Label and List)
LIMESTONE - CRUSHED STONE

Note: Blank spaces are not permitted. If any item is not applicable, or no information is available, the space must be marked to indicate that.

Section I

Manufacturer's Name MATERIAL SERVICE CORPORATION	Emergency Telephone Number 312-372-3600
Address (Number, Street, City, State, and ZIP Code) 222 N. LA SALLE STREET	Telephone Number for Information 312-372-3600
CHICAGO, ILLINOIS 60601	Date Prepared 6/6/89
	Signature of Preparer (optional)

Section II — Hazardous Ingredients/Identity Information

Hazardous Components (Specific Chemical Identity, Common Name(s))	OSHA PEL	ACGIH TLV	Other Limits Recommended	% (approx)
CALCIUM CARBONATE CAS- 1317-65-3	SEE LIMITS BELOW			
CA CO ₃				

DUST MAY CONTAIN RESPIRABLE SILICA PARTICLES. CAS 14808-60-7

EXPOSURE LIMITS ARE EXPRESSED AS MILLIGRAMS OF SUBSTANCE PER CUBIC METER OF AIR (mg/m³), 8-HOUR TIME
WEIGHTED AVERAGES. RESPIRABLE DUST EXPOSURE LIMITS VARY WITH THE % QUARTZ IN DUST

DUST < 1% QUARTZ: TOTAL: ACGIH & MSHA = 10, OSHA = 15 RESPIRABLE: MSHA & OSHA = 5

DUST ≥ 1% QUARTZ TOTAL: MSHA = 30 ÷ (% QUARTZ + 3), OSHA = 30 ÷ (% QUARTZ + 2).

RESPIRABLE: MSHA & OSHA = 10 ÷ (% QUARTZ + 2).

RESPIRABLE QUARTZ: ACGIH = 0.1 mg QUARTZ/m³.

Section III — Physical/Chemical Characteristics

Boiling Point DECOMPOSES	1652° G	Specific Gravity (H ₂ O = 1)	2.7-2.95
Vapor Pressure (mm Hg.)	N/A	Melting Point	N/A
Vapor Density (AIR = 1)	N/A	Evaporation Rate (Butyl Acetate = 1)	N/A
Solubility in Water NEGLECTIBLE			

Appearance and Odor
WHITE TO OFF WHITE IN COLOR - ODORLESS SOLID

Section IV — Fire and Explosion Hazard Data

Flash Point (Method Used) N/A	Flammable Limits N/A	LEL N/A	UEL N/A
Extinguishing Media N/A			
Special Fire Fighting Procedures NONE REQUIRED			

Unusual Fire and Explosion Hazards
NONE KNOWN

Stability	Unstable		Conditions to Avoid	N/A
	Stable	X		N/A

Incompatibility (Materials to Avoid)

AVOID CONTACT WITH STRONG ACIDS

Hazardous Decomposition or Byproducts

NONE KNOWN

Hazardous Polymerization	May Occur		Conditions to Avoid	N/A
	Will Not Occur	X		N/A

Section VI — Health Hazard Data

Route(s) of Entry:	Inhalation?	Skin?	Ingestion?
	YES	NO	NO

Health Hazards (Acute and Chronic)

ACUTE: EXPOSURE TO DUST MAY IRRITATE RESPIRATORY SYSTEM, EYES AND SKIN. CHRONIC EXPOSURE TO RESPIRABLE LIMESTONE DUST IN EXCESS OF EXPOSURE LIMITS COULD CAUSE PNEUMOCONIOSIS (LUNG DISEASE). CHRONIC EXPOSURE TO RESPIRABLE QUARTZ - CONTAINING LIMESTONE DUST IN EXCESS OF EXPOSURE LIMITS COULD CAUSE SILICOSIS.

Carcinogenicity:	NTP?	IARC Monographs?	OSHA Regulated?
	NO	NO	NO

IARC HAS DETERMINED THAT THERE IS SUFFICIENT EVIDENCE FOR CARCINOGENICITY TO EXPERIMENTAL ANIMALS EXPOSED TO CRYSTALLINE SILICA (A COMPONENT OF THIS PRODUCT) AND LIMITED EVIDENCE FOR CARCINOGENICITY TO HUMANS. "LIMITED EVIDENCE" MEANS THAT A CAUSAL RELATIONSHIP IS POSSIBLE; HOWEVER, OTHER EXPLANATIONS SUCH AS CHANCE, BIAS OR CONFOUNDING FACTORS CANNOT ADEQUATELY BE EXCLUDED.

Signs and Symptoms of Exposure

SYMPTOMS OF SILICOSIS MAY INCLUDE SHORTNESS OF BREATH, DIFFICULTY BREATHING WITH/WITHOUT EXERTION, COUGHING, DIMINISHED WORK CAPACITY REDUCTION OF LUNG VOLUME AND RIGHT HEART ENLARGEMENT AND/OR FAILURE.

Medical Conditions

Generally Aggravated by Exposure INHALING RESPIRABLE DUST MAY AGGRAVATE EXISTING RESPIRATORY SYSTEM DISEASE(S) AND/OR

DYSFUNCTIONS. EXPOSURE TO DUST MAY AGGRAVATE EXISTING SKIN AND/OR EYE CONDITIONS.

Emergency and First Aid Procedures

INHALATION: REMOVE TO FRESH AIR EYES: FLUSH WITH WATER. GET MEDICAL ATTENTION SKIN: WASH WITH SOAP AND WATER.

Section VII — Precautions for Safe Handling and Use

Steps to Be Taken in Case Material is Released or Spilled

SPILLED MATERIALS, WHERE DUST CAN BE GENERATED MAY EXPOSE CLEAN-UP PERSONNEL TO RESPIRABLE DUST, WETTING OF SPILLED MATERIAL AND/OR USE OF RESPIRATORY EQUIPMENT MAY BE NECESSARY.

Waste Disposal Method

DISPOSE OF WASTE MATERIALS IN ACCORDANCE WITH FEDERAL, STATE AND LOCAL REGULATIONS

Precautions to Be Taken in Handling and Storing

RESPIRABLE DUST MAY BE GENERATED DURING HANDLING AND STORAGE. THE CONTROL MEASURES IDENTIFIED IN SECTION VIII OF THE MSDA SHOULD BE APPLIED

Other Precautions

Section VIII — Control Measures

Respiratory Protection (Specify Type) NIOSH-MSHA APPROVED DUST RESPIRATOR FOR CONDITIONS WHERE DUST LEVELS EXCEED APPLICABLE EXPOSURE LIMITS

Ventilation	Local Exhaust	USE TO REDUCE DUST CONCENTRATIONS BELOW APPLICABLE EXPOSURE LIMITS	Special	N/A
	Mechanical (General)	USE TO REDUCE DUST CONCENTRATIONS BELOW APPLICABLE EXPOSURE LIMITS	Other	N/A

Protective Gloves

YES, USE TO PREVENT SKIN CONTACT

Eye Protection

YES, SAFETY GLASSES AND/OR GOGGLES

Other Protective Clothing or Equipment

YES, WEAR LONG SLEEVE SHIRT AND LONG PANTS TO PREVENT SKIN CONTACT

Work Hygienic Practices

WASH EXPOSED SKIN WITH SOAP AND WATER, WASH WORK CLOTHES FREQUENTLY

MATERIAL SAFETY DATA SHEET

Chemtec Chemical Transportation Emergency
Telephone No.: 800-424-9300; District of
Columbia: 202-483-7616

Emergency
Telephone No. 216/622-5000

This MSDS applies to the following established steel grades, types, and/or trade named products:

CARBON HOT/COLD ROLLED SHEETS, STRIP, AND PLATE, 1008 THRU 1046 INCLUSIVE

1. HAZARDOUS INGREDIENTS

MATERIAL	CAS #	% (RANGE)	ACGIH-TLV	OSHA-PEL
Iron	7439-89-6	98-99	5 mg/M3 (oxide fumes)	10 mg/M3 (oxide fume)
Carbon	7440-44-0	<1.0	Not Listed	Not Listed
Manganese	7439-96-5	.25-1.65	5 mg/M3	5 mg/M3 (Dust)
Phosphorus	7723-14-0	.04 Max	0.1/M3	0.1 mg/M3 (yellow)
Sulphur	7704-34-9	.001-.35	5 mg/M3	13mg/M3 (Sulphur dioxide)

(OPTIONAL): Light surface coating of petroleum oil and greased edges. Use of gloves is recommended to prevent skin irritation.

NOTE: See additional comments on the back under item #7.

2. PHYSICAL DATA

Not Applicable

3. FIRE AND EXPLOSION HAZARD DATA

Not Applicable

DISCLAIMER

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The information contained in this Material Safety Data Sheet (MSDS) is believed to be correct, but no representations, guarantees or warranties of any kind are made as to its accuracy, suitability for particular application, hazards connected with the use of the material or the results to be obtained from the use thereof. User assumes all risk and liability of any use, processing or handling of any material. Variations in methods, conditions, equipment used to store, handle or process the material and hazards connected with the use of the material are solely the responsibility of the user and remain at its sole discretion.

As sold, the product described in this MSDS is considered by Metalsource to be an "article" within the meaning of Title 29 of the Code of Federal Regulations, Section 1910.1200 et seq. This MSDS is intended to be used solely for the purpose of satisfying informational requests made pursuant to that requirement. Compliance with all applicable federal, state, and local laws and regulations remains the responsibility of the user, and the user has the responsibility to provide a safe workplace, to examine all aspects of its operation, and to determine if or where precautions, in addition to those described herein, are or may be required.

4. SPECIAL PROTECTION INFORMATION

VENTILATION: Local exhaust should be used to keep worker exposure below accepted exposure limits during welding and grinding operations.

RESPIRATORY PROTECTION: When engineering or administrative controls are not feasible to control overexposure or while they are being instituted, appropriate NIOSH approved respirators shall be used, and selected according to 29 CFR 1910.34.

EYE PROTECTION: Appropriate protective eye and face equipment shall be worn when there is a reasonable probability of injury that can be prevented by such equipment (such as welding, grinding).

PROTECTIVE GLOVES: Appropriate and as needed to protect against exposure to chemical or physical hazards.

OTHER: N/A

5. PHYSIOLOGICAL EFFECTS

PRIMARY ROUTE OF EXPOSURE	THRESHOLD LIMIT VALUE (TLV)
Inhalation of fumes from welding or burning; dusts from grinding or cutting.	N/A

EFFECTS OF OVEREXPOSURE

Acute: Excessive inhalation of fumes from many metals can product an acute reaction known as "metal fume fever". Though metals such as copper and zinc have been most associated with metal fume fever, it is suspected by some authorities (Casarett and Doull's Toxicology: The Basic Science of Poisons; Hamilton and Hardy: Industrial Toxicology) that other metallic fumes may produce this condition. Symptoms consist of chills and fever (very similar to and easily confused with flu symptoms), which come on a few hours after large exposures. Long-term effects of metal fume fever have not been noted.

Chronic: Only after six to ten years of exposure to iron dust or fume does one present any signs of pneumoconiosis. Physical examinations of those exposed to iron dust have not indicated any disability.

Excessive and prolonged inhalation of manganese (generally over 2 years exposure) can cause damage to the central nervous system. Specifically, the pathology resembles Parkinson's Disease. Other chronic effects may include bronchitis and pneumonitis.

6. EMERGENCY AND FIRST AID PROCEDURES

If acute overexposure to fumes occurs, remove victim from the adverse environment immediately to fresh air and seek medical attention.

7. ADDITIONAL COMMENTS

NOTE: The percent composition reflects the range that is possible within this GROUP of products. These are not the technical specifications for a particular product. Actual composition will fall within this range, but will depend on specifications for the particular product. Thus, when welding or cutting products containing manganese (for example), the potential for exposure to manganese obviously increases as their percentage composition increases. Therefore, we strongly urge that all operations with potentially hazardous exposures be evaluated by a competent industrial hygienist. See Section 4 & 5 for further information.

The steel itself presents no health hazard unless it is welded, burned, ground or cut. During these procedures it is possible that hazardous amounts of fume or dusts may be generated. It is advised that your particular operation be evaluated by a competent health professional to determine whether or not a hazard exists.

PREPARED UNDER
DIRECTION OF: W R. BELL

DATE:
OCTOBER 22, 1985

TELEPHONE NO.
216/441-6600

SUPERSEDES MSDS DATED
N/A

MATERIAL SAFETY DATA SHEET

CERRO COPPER PRODUCTS COMPANY
MSDS NUMBER: CERRO-CO-0744

Chemtrac Chemical Transportation Emergency
Telephone No.: 800-424-9300; District of
Columbia: 202-483-7616

Telephone No. 216/622-5000

This MSDS applies to the following established steel grades, types, and/or trade named products:

CARBON HOT/COLD ROLLED SHEETS, STRIP, AND PLATE, HIGH STRENGTH-LOW ALLOY

1. HAZARDOUS INGREDIENTS

-----PERMISSIBLE AIR LEVEL-----				
MATERIAL	CAS #	% (RANGE)	ACGIH-TLV (Mg/M ³)	OSHA-PEL (Mg/M ³)
Iron	7439-89-6	Balance	5 (Oxide fume)	10 (Oxide fume)
Carbon	7440-44-0	.01-1.2	Not Listed	Not Listed
Manganese	7439-96-5	.25-2.0	5 (Dust)	5 (Ceiling Limit)
Chromium	7740-47-3	.01-2.0	.05 (Cr VI-Compounds)	0.1 (Cr-Metal)
Nickel	7740-02-0	.01-1.0	1	1
Copper	7740-58-0	.01-1.0	0.2 (Fume)	0.2 (Fume)
Trace Elements	N/A	<2.0	N/A	N/A

(OPTIONAL): Light surface coating of petroleum oil and greased edges. Use of gloves is recommended to prevent skin irritation.

NOTE: See additional comments on the back under item #7.

2. PHYSICAL DATA

Not Applicable

3. FIRE AND EXPLOSION HAZARD DATA

Not Applicable

DISCLAIMER

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4. SPECIAL PROTECTION INFORMATION

VENTILATION: Local exhaust should be used to keep worker exposure below accepted exposure limits during welding and grinding operations.

RESPIRATORY PROTECTION: When engineering or administrative controls are not feasible to control overexposure or while they are being instituted, appropriate NIOSH approved respirators shall be used, and selected according to 29 CFR 1910.34.

EYE PROTECTION: Appropriate protective eye and face equipment shall be worn when there is a reasonable probability of injury that can be prevented by such equipment (such as welding, grinding).

PROTECTIVE GLOVES: Appropriate and as needed to protect against exposure to chemical or physical hazards.

OTHER: N/A

5. PHYSIOLOGICAL EFFECTS

PRIMARY ROUTE OF EXPOSURE	THRESHOLD LIMIT VALUE (TLV)
Inhalation of fumes from welding or burning; dusts from grinding or cutting.	N/A

EFFECTS OF OVEREXPOSURE

Chronic inhalation of high concentrations of iron oxide fumes or dusts may lead to a benign pneumoconiosis (siderosis). Inhalation of high concentrations of ferric oxide may possibly enhance the risk of lung cancer development in workers exposed to pulmonary carcinogens.

The inhalation of high concentrations of freshly formed oxide fumes and dusts of Manganese, Copper, Lead and/or Zinc in the respirable particle size range can cause an influenza-like illness termed metal fume fever. Typical symptoms last 12 to 48 hours and are characterized by metallic taste in the mouth, dryness and irritation of the throat, followed by weakness, muscle pain, fever and chills.

Exposure to high concentration of nickel dusts and fumes can cause sensitization dermatitis, respiratory irritation, asthma, pulmonary fibrosis and edema. Certain forms of nickel dust may cause nasal or lung cancer in humans.

Repeated or prolonged exposure to hexavalent chromium compounds may cause respiratory irritation, nosebleed, ulceration and perforation of the nasal septum. Industrial exposure to certain forms of hexavalent chromium has been related to an increased incidence of lung cancer.

6. EMERGENCY AND FIRST AID PROCEDURES

If acute overexposure to fumes occurs, remove victim from the adverse environment immediately to fresh air and seek medical attention.

7. ADDITIONAL COMMENTS

NOTE: The percent composition reflects the range that is possible within this GROUP of products. These are not the technical specifications for a particular product. Actual composition will fall within this range, but will depend on specifications for the particular product. Thus, when welding or cutting products containing manganese (for example), the potential for exposure to manganese obviously increases as their percentage composition increases. Therefore, we strongly urge that all operations with potentially hazardous exposures be evaluated by a competent industrial hygienist. See Section 4 & 5 for further information.

The steel itself presents no health hazard unless it is welded, burned, ground or cut. During these procedures it is possible that hazardous amounts of fume or dusts may be generated. It is advised that your particular operation be evaluated by a competent health professional to determine whether or not a hazard exists.

PREPARED UNDER
DIRECTION OF: W.R. BELL

DATE: OCTOBER 9, 1985

TELEPHONE NO. 216/441-6600

SUPERSEDES MSDS DATED
N/A



metalsource

An ALCO Standard Company

7500 Grand Division Avenue • Cleveland, Ohio 44125 • (216)441-6600

MATERIAL SAFETY DATA

Chemtrec Chemical Transportation Emergency
Telephone No.: 800-424-9300; District of
Columbia: 202-483-7616

Emergency
Telephone No. 216/622-5000

This MSDS applies to the following established steel grades, types, and/or trade named products:

CARBON HOT DIPPED GALVANIZED STEEL PRODUCTS: COILS, SHEETS, STRIP & PLATE

1. HAZARDOUS INGREDIENTS

-----PERMISSIBLE AIR LEVEL-----				
MATERIAL	CAS #	% (RANGE)	ACGIH-TLV (Mg/M ³)	OSHA-PEL (Mg/M3)
Iron	7439-89-6	Balance	5 (oxide fume)	10 (oxide fume)
Carbon	7440-44-0	.01-1.2	Not Listed	Not Listed
Manganese	7439-96-5	.25-2.0	5 (dust)	5 (ceiling limit)
Chromium	7740-47-3	.01-2.0	.05 (Cr VI-Compounds)	0.1 (Cr - Metal)
Nickel	7740-02-0	.01-1.0	1	1
Copper	7740-58-0	.01-1.0	0.2 (fume)	0.2 (fume)
Trace Elements	N/A	<2.0	N/A	N/A
Metallic Coating:				
Zinc	7440-66-6	99.0 Min	5.0 (Zinc Oxide Fume)	5.0 (Zinc Oxide Fume)
Trace Elements	N/A	<1.0	N/A	N/A

(OPTIONAL): Light surface coating of petroleum oil, greased edges, chromatic treatment or phosphate, borax and stearate soaps. The possible presence of these coatings should be considered when evaluating employee health hazards and exposures during welding or other dust/fume generating activities. Use of gloves is recommended to prevent skin irritation.

NOTE: See additional comments on the back under item #7.

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2. PHYSICAL DATA

Not Applicable

3. FIRE AND EXPLOSION HAZARD DATA

Not Applicable

4. SPECIAL PROTECTION INFORMATION

VENTILATION: Local exhaust should be used to keep worker exposure below accepted exposure limits during welding and grinding operations.

RESPIRATORY PROTECTION: When engineering or administrative controls are not feasible to control overexposure or while they are being instituted, appropriate NIOSH approved respirators shall be used, and selected according to 29 CFR 1910.34.

EYE PROTECTION: Appropriate protective eye and face equipment shall be worn when there is a reasonable probability of injury that can be prevented by such equipment (such as welding, grinding).

PROTECTIVE GLOVES: Appropriate and as needed to protect against exposure to chemical or physical hazards.

OTHER: N/A

5. PHYSIOLOGICAL EFFECTS

PRIMARY ROUTE OF EXPOSURE

THRESHOLD LIMIT VALUE (TLV)

Inhalation of fumes from welding or burning;
dusts from grinding or cutting.

N/A

EFFECTS OF OVEREXPOSURE

Acute: Excessive inhalation of fumes from many metals can produce an acute reaction known as "metal fume fever". Though metals such as copper and zinc have been most associated with metal fume fever, it is suspected by some authorities (Casarett and Doull's Toxicology: The Basic Science of Poisons; Hamilton and Hardy: Industrial Toxicology) that other metallic fumes may produce this condition. Symptoms consist of chills and fever (very similar to and easily confused with flu symptoms), which come on a few hours after large exposure. Long-term effects of metal fume fever have not been noted.

Chronic: Only after six to ten years of exposure to iron dust or fume does one present any signs of pneumoconiosis. Physical examinations of those exposed to iron dust have not indicated any disability.

Excessive and prolonged inhalation of manganese (generally over 2 years exposure) can cause damage to the central nervous system. Specifically, the pathology resembles Parkinson's Disease. Other chronic effects may include bronchitis and pneumonitis.

6. EMERGENCY AND FIRST AID PROCEDURES

If acute overexposure to fumes occurs, remove victim from the adverse environment immediately to fresh air and seek medical attention.

7. ADDITIONAL COMMENTS

NOTE: The percent composition reflects the range that is possible within this GROUP of products. These are not the technical specifications for a particular product. Actual composition will fall within this range, but will depend on specifications for the particular product. Thus, when welding or cutting products containing manganese (for example), the potential for exposure to manganese obviously increases as their percentage composition increases. Therefore, we strongly urge that all operations with potentially hazardous exposures be evaluated by a competent industrial hygienist. See Section 4 & 5 for further information.

The steel itself presents no health hazard unless it is welded, burned, ground or cut. During these procedures it is possible that hazardous amounts of fume or dusts may be generated. It is advised that your particular operation be evaluated by a competent health professional to determine whether or not a hazard exists.

PREPARED UNDER

DIRECTION OF:

W.R. BELL

DATE:

NOVEMBER 12, 1985

TELEPHONE NO.

216/441-6600

SUPERSEDES MSDS DATED

N/A

M A T E R I A L S A F E T Y D A T ACERRO COPPER PRODUCTS COMPANY
MSDS NUMBER: CERP-CO-0046Chemtrec Chemical Transportation Emergency
Telephone No.: 800-424-9300; District of
Columbia: 202-483-7616Emergency
Telephone No. 216/622-5000

This MSDS applies to the following established steel grades, types, and/or trade named products:

CARBON STEELS, NON-RESULFURIZED, 1008-1095 INCLUSIVE - ALL FORMS

1. HAZARDOUS INGREDIENTS

MATERIAL	CAS #	% (RANGE)	ACGIH-TLV	OSHA-PEL
Iron	7439-89-6	>95	5 mg/M3 (oxide fumes)	10 mg/M3 (oxide fumes)
Carbon	7440-44-0	<1.03	Not Listed	Not Listed
Manganese	7439-96-5	<1.0	5 mg/M3	5 mg/M3 (Dust)
Phosphorus	7723-14-0	<0.5	0.1/M3	0.1 mg/M3 (Yellow)
Sulphur	7704-34-9	<0.5	5 mg/M3	13mg/M3 (Sulphur Dioxide)

(OPTIONAL): Light surface coating of petroleum oil. Use of gloves is recommended to prevent skin irritation.

NOTE: See additional comments on the back under item #7.

2. PHYSICAL DATA

Not Applicable.

3. FIRE AND EXPLOSION HAZARD DATA

Not Applicable.

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4. SPECIAL PROTECTION INFORMATION

VENTILATION: Local exhaust should be used to keep worker exposure below accepted exposure limits during welding and grinding operations.

RESPIRATORY PROTECTION: When engineering or administrative controls are not feasible to control overexposure or while they are being instituted, appropriate NIOSH approved respirators shall be used, and selected according to 29 CFR 1910.34.

EYE PROTECTION: Appropriate protective eye and face equipment shall be worn when there is a reasonable probability of injury that can be prevented by such equipment (such as welding, grinding).

PROTECTIVE GLOVES: Appropriate and as needed to protect against exposure to chemical or physical hazards.

OTHER: N/A

5. PHYSIOLOGICAL EFFECTS

PRIMARY ROUTE OF EXPOSURE

THRESHOLD LIMIT VALUE (TLV)

Inhalation of fumes from welding or burning;
dusts from grinding or cutting.

N/A

EFFECTS OF OVEREXPOSURE

Acute: Excessive inhalation of fumes from many metals can produce an acute reaction known as "metal fume fever". Though metals such as copper and zinc have been most associated with metal fume fever, it is suspected by some authorities (Casarett and Doull's Toxicology: The Basic Science of Poisons; Hamilton and Hardy: Industrial Toxicology) that other metallic fumes may produce this condition. Symptoms consist of chills and fever (very similar to and easily confused with flu symptoms), which come on a few hours after large exposure. Long-term effects of metal fume fever have not been noted.

Chronic: Only after six to ten years of exposure to iron dust or fume does one present any signs of pneumoconiosis. Physical examinations of those exposed to iron dust have not indicated any disability.

Excessive and prolonged inhalation of manganese (generally over 2 years exposure) can cause damage to the central nervous system. Specifically, the pathology resembles Parkinson's Disease. Other chronic effects may include bronchitis and pneumonitis.

6. EMERGENCY AND FIRST AID PROCEDURES

If acute overexposure to fumes occurs, remove victim from the adverse environment immediately to fresh air and seek medical attention.

7. ADDITIONAL COMMENTS

NOTE: The percent composition reflects the range that is possible within the GROUP of products. These are not the technical specifications for a particular product. Actual composition will fall within this range, but will depend on specifications for the particular product. Thus, when welding or cutting products containing manganese (for example), the potential for exposure to manganese obviously increases as their percentage composition increases. Therefore, we strongly urge that all operations with potentially hazardous exposures be evaluated by a competent industrial hygienist. See Section 4 & 5 for further information.

The steel itself presents no health hazard unless it is welded, burned, ground or cut. During these procedures it is possible that hazardous amounts of fume or dusts may be generated. It is advised that your particular operation be evaluated by a competent health professional to determine whether or not a hazard exists.

PREPARED UNDER
DIRECTION OF: W.R. BELL

DATE:
November 7, 1985

TELEPHONE NO.
216/441-6600

SUPERSEDES MSDS DATED
N/A

MATERIAL SAFETY I

Chemtrec Chemical Transportation Emergency
Telephone No.: 800-424-9300; District of
Columbia: 202-483-7616

Emergency
Telephone No. 216/622-5000

This MSDS applies to the following established steel grades, types, and/or trade named products:

ALLOY STEELS, HOT ROLLED/COLD FINISHED STANDARD GRADES 1330-9260 INCLUDING
NITRIDING STEEL, AISI-4130, 4140, 4145, 4150, 6150, 8620, 52100.

1. HAZARDOUS INGREDIENTS

MATERIAL	CAS #	% (RANGE)	ACGIH-TLV (Mg/M3)	OSHA-PEL (Mg/M3)
Iron	7439-89-6	86-99	5 (Oxide fumes)	10 (oxide fume)
Carbon	7440-44-0	.01-1.10	N/A	N/A
Manganese	7439-96-5	.25-2.00	5	5 (Dust)
Phosphorus	7723-14-0	.035 Max	0.1	0.1 (Yellow)
Sulphur	7704-34-9	.001-.10	5	13 (Sulphur Dioxide)
Silicon	7740-21-3	.15-2.20	N/A	N/A
Nickel	7740-02-0	.01-2.50	1	1
Chromium	7740-47-3	.01-2.50	0.5	.5 Soluble Chromic Chromous Salts (VI) 1 Chrome & Insoluble Salts
Molybdenum	7439-98-7	.01-1.10	5 Soluble Compounds 10 Insoluble Compounds	5 Soluble Compounds 15 Insoluble Compounds
Vanadium	7440-6-22	.01-.50	0.05 RESP. 0.01 (Pentoxide Fume)	.5 (Dust) .1 (Fume)
*Aluminum	7429-90-5	<2.0	5	N/A

(*Nitriding steel only)

(OPTIONAL): Coatings trace surface coating of petroleum oil, phosphate or dry lube (borax or lime).

NOTE: Use gloves to prevent skin irritation.
See additional comments under item # 7.

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(Disclaimer continued on other side)

(Disclaimer - continued)

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2. PHYSICAL DATA

Not Applicable.

3. FIRE AND EXPLOSION HAZARD DATA

Not Applicable.

4. SPECIAL PROTECTION INFORMATION

VENTILATION: Local exhaust should be used to keep worker exposure below accepted exposure limits during welding and grinding operations.

RESPIRATORY PROTECTION: When engineering or administrative controls are not feasible to control overexposure or while they are being instituted, appropriate NIOSH approved respirators shall be used, and selected according to 29 CFR 1910.34.

EYE PROTECTION: Appropriate protective eye and face equipment shall be worn when there is a reasonable probability of injury that can be prevented by such equipment (such as welding, grinding).

PROTECTIVE GLOVES: Appropriate and as needed to protect against exposure to chemical or physical hazards.

OTHER: N/A

5. PHYSIOLOGICAL EFFECTS

PRIMARY ROUTE OF EXPOSURE

THRESHOLD LIMIT VALUE (TLV)

Inhalation of fumes from welding or burning;
dusts from grinding or cutting.

N/A

EFFECTS OF OVEREXPOSURE

Acute: Excessive inhalation of fumes from many metals can produce an acute reaction known as "metal fume fever". Though metals such as copper and zinc have been most associated with metal fume fever, it is suspected by some authorities (Casarett and Doull's Toxicology: The Basic Science of Poisons; Hamilton and Hardy: Industrial Toxicology) that other metallic fumes may produce this condition. Symptoms consist of chills and fever (very similar to and easily confused with flu symptoms), which come on a few hours after large exposures. Long-term effects of metal fume fever have not been noted.

Nickel - Irritation of eyes, nose and lungs; dermatitis.

Chromium - Irritation of eyes, nose and lungs; dermatitis.

Molybdenum - Slight irritation of eyes, nose and throat.

Vanadium - Irritant to the conjunctivae and respiratory tract (greenish-black discoloration of the tongue and shortness of breath).

Chronic: Only after six to ten years of exposure to iron dust or fume does one present any signs of pneumoconiosis. Physical examinations of those exposed to iron dust have not indicated any disability.

Excessive and prolonged inhalation of manganese (generally over 2 years exposure) can cause damage to the central nervous system. Specifically, the pathology resembles Parkinson's Disease. Other chronic effects may include bronchitis and pneumonitis.

Nickel - Various forms of dermatitis, inflammation and/or ulceration of upper respiratory tract, and possibly cancer of nasal passages and lungs.

Based upon available information, there does not appear to be any evidence that exposure to welding fumes induces human cancers.

Chromium - (Same as nickel.)

Molybdenum - Pain in joints, hands, knees, and feet.

Vanadium - No reported cases of exposure to vanadium.

6. EMERGENCY AND FIRST AID PROCEDURES

If acute overexposure to fumes occurs, remove victim from the adverse environment immediately to fresh air and seek medical attention.

7. ADDITIONAL COMMENTS

NOTE: The percent composition reflects the range that is possible within this GROUP of products. These are not the technical specifications for a particular product. Actual composition will fall within this range, but will depend on specifications for the particular product. Thus, when welding or cutting products containing manganese (for example), the potential for exposure to manganese obviously increases as their percentage composition increases. Therefore, we strongly urge that all operations with potentially hazardous exposures be evaluated by a competent industrial hygienist. See Section 4 and 5 for further information.

The steel itself presents no health hazard unless it is welded, burned, ground, or cut. During these procedures it is possible that hazardous amounts of fume or dusts may be generated. It is advised that your particular operation be evaluated by a competent health professional to determine whether or not a hazard exists.

PREPARED UNDER
DIRECTION OF:

W.R. BELL

DATE:

NOVEMBER 6, 1985

TELEPHONE NO.

216/441-6600

SUPERSEDES MSDS DATED

N/A

M A T E R I A L S A F E T Y

Chemtrec Chemical Transportation Emergency
Telephone No.: 800-424-9300; District of
Columbia: 202-483-7616

Emergency
Telephone No. 216/622-5000

This MSDS applies to the following established steel grades, types, and/or trade named products:

ALLOY STEELS, HOT ROLLED/COLD FINISHED HY-TEN ^(R) B3X, B3X 40, A.S.T.M. 322-82

1. HAZARDOUS INGREDIENTS

MATERIAL	CAS #	% (RANGE)	ACGIH-TLV (Mg/M3)	OSHA-PEL (Mg/M3)
Iron	7439-89-6	86-99	5 (Oxide fumes)	10 (Oxide fume)
Carbon	7440-44-0	.33-.55	N/A	N/A
Manganese	7439-96-5	.68 - 1.20	5	5 (Dust)
Phosphorus	7723-14-0	.04 Max	0.1	0.1 (Yellow)
Sulphur	7704-34-9	.06 - .10	5	13 (Sulphur Dioxide)
Silicon	7740-21-3	.15-.35	N/A	N/A
Nickel	7740-02-0	.25 Max	1	1
Chromium	7740-47-3	.55-1.10	0.5	.5 Soluble Chromic Chromous Salts (VI) 1 Chrome & Insoluble Salts
Molybdenum	7439-98-7	.15-.25	5 Soluble Compounds 10 Insoluble Compounds	5 Soluble Compounds 15 Insoluble Compounds

(OPTIONAL): Coatings trace surface coating of petroleum oil, phosphate or dry lube (borax or lime).

NOTE: Use gloves to prevent skin irritation.
See additional comments under item #7.

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2. PHYSICAL DATA

Not Applicable.

4. SPECIAL PROTECTION INFORMATION

VENTILATION: Local exhaust should be used to keep worker exposure below accepted exposure limits during welding and grinding operations.

RESPIRATORY PROTECTION: When engineering or administrative controls are not feasible to control overexposure or while they are being instituted, appropriate NIOSH approved respirators shall be used, and selected according to 29 CFR 1910.34.

EYE PROTECTION: Appropriate protective eye and face equipment shall be worn when there is a reasonable probability of injury that can be prevented by such equipment (such as welding, grinding).

PROTECTIVE GLOVES: Appropriate and as needed to protect against exposure to chemical or physical hazards.

OTHER: N/A

5. PHYSIOLOGICAL EFFECTS

PRIMARY ROUTE OF EXPOSURE

THRESHOLD LIMIT VALUE (TLV)

Inhalation of fumes from welding or burning;
dusts from grinding or cutting.

N/A

EFFECTS OF OVEREXPOSURE

Acute: Excessive inhalation of fumes from many metals can produce an acute reaction known as "metal fume fever". Though metals such as copper and zinc have been most associated with metal fume fever, it is suspected by some authorities (Casarett and Doull's Toxicology: The Basic Science of Poisons; Hamilton and Hardy: Industrial Toxicology) that other metallic fumes may produce this condition. Symptoms consist of chills and fever (very similar to and easily confused with flu symptoms), which come on a few hours after large exposure. Long-term effects of metal fume fever have not been noted.

Nickel - Irritation of eyes, nose and lungs; dermatitis.

Chromium - Irritation of eyes, nose and lungs; dermatitis.

Molybdenum - Slight irritation of eyes, nose and throat.

Chronic: Only after six to ten years of exposure to iron dust or fume does one present any signs of pneumoconiosis. Physical examinations of those exposed to iron dust have not indicated any disability.

Excessive and prolonged inhalation of manganese (generally over 2 years exposure) can cause damage to the central nervous system. Specifically, the pathology resembles Parkinson's Disease. Other chronic effects may include bronchitis and pneumonitis.

Nickel - Various forms of dermatitis, inflammation and/or ulceration of upper respiratory tract, and possibly cancer of nasal passages and lungs.
Based upon available information, there does not appear to be any evidence that exposure to welding fumes induces human cancers.

Chromium - (Same as nickel.)

Molybdenum - Pain in joints, hands, knees, and feet.

6. EMERGENCY AND FIRST AID PROCEDURES

If acute overexposure to fumes occurs, remove victim from the adverse environment immediately to fresh air and seek medical attention.

7. ADDITIONAL COMMENTS

NOTE: The percent composition reflects the range that is possible within the GROUP of products. These are not the technical specifications for a particular product. Actual composition will fall within this range, but will depend on specifications for the particular product. Thus, when welding or cutting products containing manganese (for example), the potential for exposure to manganese obviously increases as their percentage composition increases. Therefore, we strongly urge that all operations with potentially hazardous exposures be evaluated by a competent industrial hygienist. See Section 4 and 5 for further information.

The steel itself presents no health hazard unless it is welded, burned, ground, or cut. During these procedures it is possible that hazardous amounts of fume or dusts may be generated. It is advised that your particular operation be evaluated by a competent health professional to determine whether or not a hazard exists.

PREPARED UNDER

DATE:

DIRECTION OF:

W.R. BELL

NOVEMBER 6, 1985

TELEPHONE NO.

SUPERSEDES MSDS DATED

216/441-6600

N/A

M A T E R I A L S A F E T Y

Chemtrec Chemical Transportation Emergency
Telephone No.: 800-424-9300; District of
Columbia: 202-483-7616

Emergency
Telephone No. 216/622-5000

This MSDS applies to the following established steel grades, types, and/or trade named products:

CARBON STEELS, RESULFURIZED, 1110-1151 INCLUSIVE - ALL FORMS
CARBON STEELS, RESULFURIZED, 11L10-11L51 INCLUSIVE - LEADED - ALL FORMS
CARBON STEELS, RESULFURIZED, 12L11-12L15 INCLUSIVE - LEADED - ALL FORMS

1. HAZARDOUS INGREDIENTS

MATERIAL	CAS #	% (RANGE)	ACGIH-TLV	OSHA-PEL
Iron	7439-89-6	>95	5 mg/M3 (Oxide fumes)	10 mg/M3 (oxide fumes)
Carbon	7440-44-0	<1.03	Not Listed	Not Listed
Manganese	7439-96-5	<1.7	5 mg/M3	5 mg/M3 (Dust)
Phosphorus	7723-14-0	<0.5	0.1/M3	0.1mg/M3 (Yellow)
Sulphur	7704-34-9	<0.5	5 mg/M3	13 mg/M3 (Sulphur Dioxide)
(Applies to leaded Grades only - having L in grade number)				
Lead	7439-92-1	<0.5	0.15 (dusts & fumes)	0.05 (dusts & fumes)
Tellurium	13494-80-9	<0.2	0.1 (as Te Compounds)	0.1 (as Te compounds)
(OPTIONAL): Light surface coating of petroleum oil. Use of gloves is recommended to prevent skin irritation.				
NOTE: See additional comments on the back under Item #7.				

2. PHYSICAL DATA

Not Applicable.

3. FIRE AND EXPLOSION HAZARD DATA

Not Applicable.

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4. SPECIAL PROTECTION INFORMATION

VENTILATION: Local exhaust should be used to keep worker exposure below accepted exposure limits during welding and grinding operations.

RESPIRATORY PROTECTION: When engineering or administrative controls are not feasible to control overexposure or while they are being instituted, appropriate NIOSH approved respirators shall be used, and selected according to 29 CFR 1910.34.

EYE PROTECTION: Appropriate protective eye and face equipment shall be worn when there is a reasonable probability of injury that can be prevented by such equipment (such as welding, grinding).

PROTECTIVE GLOVES: Appropriate and as needed to protect against exposure to chemical or physical hazards.

OTHER: N/A

5. PHYSIOLOGICAL EFFECTS

PRIMARY ROUTE OF EXPOSURE

THRESHOLD LIMIT VALUE (TLV)

Inhalation of fumes from welding or burning;
dusts from grinding or cutting.

N/A

EFFECTS OF OVEREXPOSURE

Acute: Excessive inhalation of fumes from many metals can produce an acute reaction known as "metal fume fever". Though material such as copper and zinc have been most associated with metal fume fever, it is suspected by some authorities (Casarett and Doull's Toxicology: The Basic Science of Poisons; Hamilton and Hardy: Industrial Toxicology) that other metallic fumes may produce this condition. Symptoms consist of chills and fever (very similar to and easily confused with flu symptoms), which come on a few hours after large exposure. Long-term effects of metal fume fever have not been noted.

Nickel - irritation of eyes, nose and lungs; dermatitis.

Chromium - Irritation of eyes, nose and lungs; dermatitis.

Molybdenum - Slight irritation of eyes, nose and throat.

Vanadium - Irritant to the conjunctivae and respiratory tract (greenish-black discoloration of the tongue and shortness of breath).

Lead - (lead dust fume) - ingestion or inhalation of large amounts of lead can cause severe headaches, convulsions, coma, delirium, and possibly death.

Garlic odor of breath and perspiration, metallic taste in mouth, dryness of the mouth.

Chronic: Only after six to ten years of exposure to iron dust or fume does one present any signs of pneumoconiosis. Physical examinations of those exposed to iron dust have not indicated any disability.

Excessive and prolonged inhalation of manganese (generally over 2 years exposure) can cause damage to the central nervous system. Specifically, the pathology resembles Parkinson's Disease. Other chronic effects may include bronchitis and pneumonitis.

Nickel - Various forms of dermatitis, inflammation and/or ulceration of upper respiratory tract, and possibly cancer of nasal passages and lungs.

Based upon available information, there does not appear to be any evidence that exposure to welding fumes induces human cancers.

Chromium - (same as nickel).

Molybdenum - Pain in joints, hands, knees, and feet.

Vanadium - No reported cases of exposure to vanadium.

Lead - (Lead dust fume) - Headache, constipation, abdominal pains, decreased appetite, central nervous system damage, and reproductive effects.

6. EMERGENCY AND FIRST AID PROCEDURES

If acute overexposure to fumes occurs, remove victim from the adverse environment immediately to fresh air and seek medical attention.

7. ADDITIONAL COMMENTS

NOTE: The percent composition reflects the range that is possible within the GROUP of products. These are not the technical specifications for a particular product. Actual composition will fall within this range, but will depend on specifications for the particular product. Thus, when welding or cutting products containing manganese (for example), the potential for exposure to manganese obviously increases as their percentage composition increases. Therefore, we strongly urge that all operations with potentially hazardous exposures be evaluated by a competent industrial hygienist. See Sections 4 & 5 for further information.

The steel itself presents no health hazard unless it is welded, burned, ground or cut. During these procedures it is possible that hazardous amounts of fume or dusts may be generated. It is advised that your particular operation be evaluated by a competent health professional to determine whether or not a hazard exists.

PREPARED UNDER

DATE:

THE DIRECTION OF:

W.R. BELL

NOVEMBER 7, 1985

TELEPHONE NO. 216/441-6600

SUPERSEDES MSDS DATED:

N/A

MATERIAL SAFETY DATA

Chemtrec Chemical Transportation Emergency
Telephone No.: 800-424-9300; District of Columbia: 202-483-7616

Emergency
Telephone No. 412-339-5059

This MSDS applies to the following established steel grades, types, and/or trade named products:

GROUP 1: STAINLESS STEEL TYPES: 201, 201L, 301, 302, 302B, 304, 304F, 304LF, 304L, 304N, 304LN, 305, 308, 308L, 309, 309S, 310, 310S, 310CB, 321, 330, 332, 334, 347.

1. HAZARDOUS INGREDIENTS

MATERIAL	% (RANGE)	ACGIH-TLV (Mg/M3)	OSHA-PEL (Mg/M3)	CAS #
Iron	> 50	5 (oxide fume)	10 (oxide fume)	7439-89-6
Chromium	3-29	0.5 (metal) 0.05 (Cr+6) Suspected carcinogen-NTP & IARC See Sections 5 & 7	1 (metal)	7740-47-3
Nickel	3.5-42.5	1 (metal) Suspected carcinogen-NTP & IARC See Sections 5 & 7	1 (metal)	7740-02-0
Manganese	0.25-7.58	5 (dust) 1 (fume)	5 (dust) 5 (fume)	7439-96-5
Silicon	0.13-3.00	10 (total dust) 5 (respirable dust)	15 (total dust) 5 (respirable dust)	7740-21-3
Niobium/ Tantalum	0.002-1.10	5 (Ta)	5 (Ta)	7440-25-7

2. PHYSICAL DATA

Not Applicable.

3. FIRE AND EXPLOSION HAZARD DATA

Not Applicable.

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4. SPECIAL PROTECTION INFORMATION

VENTILATION: Local exhaust ventilation should be used to keep airborne concentrations below accepted exposure limits during welding and grinding operations.

RESPIRATORY PROTECTION: If local exhaust ventilation is not used, appropriate NIOSH approved respirators shall be used, and selected according to 29 CFR 1910.104.

EYE PROTECTION: Eye protection should be worn and face shields should be worn where there is a reasonable probability of injury.

PROTECTIVE CLOTHING: Protective clothing should be worn when working with these materials.

OTHER: None.

5. PHYSIOLOGICAL EFFECTS

PRIMARY ROUTE OF EXPOSURE

THRESHOLD LIMIT VALUE (TLV)

Inhalation of fumes from welding and grinding; dusts from grinding or cutting.

N/A

EFFECTS OF OVEREXPOSURE

ACUTE: Excessive inhalation of fumes from many metals can produce an acute reaction known as "metal fume fever". Though metals such as copper and zinc have been most associated with metal fume fever, it is suspected by some authorities (Casarett and Doull's Toxicology: The Basic Science of Poisons; Hamilton and Hardy: Industrial Toxicology) that other metallic fumes may produce this condition. Symptoms consist of chills and fever (very similar to and easily confused with flu symptoms), which come on a few hours after large exposure. Long-term effects of metal fume fever have not been noted.

CHRONIC: Excessive and repeated inhalation of chromium fumes or dust may cause severe irritation, ulceration, or cancer in the respiratory system - nose, throat and lungs. It is generally believed that the hexavalent forms of chromium (Cr+6) are responsible for these effects. It is uncertain whether metallic chromium in dust form can cause the same effects noted above. Until this issue is resolved, engineering controls or personnel protective equipment (i.e., respirators) should be utilized to assure exposures are not excessive. Similarly, excessive inhalation of nickel fumes have been associated with respiratory cancer. Both chromium and nickel are potential sensitizers, and may cause allergic reactions.

Only after six to ten years of exposure to iron dust or fume does one present any signs of pneumoconiosis. Physical examinations of those exposed to iron dust have not indicated any disability.

Excessive and prolonged inhalation of manganese (generally over 2 years exposure) can cause damage to the central nervous system. Specifically, the pathology resembles Parkinson's Disease.

Niobium is highly toxic once it reaches the blood stream. Because it is poorly absorbed, it is less toxic from the gastrointestinal tract. It has been reasonably concluded from animal studies that small additional amounts of niobium from industrial exposure may have adverse health effects over the long term when added to the niobium consumed in the human diet, particularly when added to the respiratory tract.

Tantalum is inert toward body tissues and fluids and is consequently nontoxic after industrial exposure. Pulmonary fibrosis was presented by some Russian workers, but there was no reference to tantalum concentrations or degree of exposure.

6. EMERGENCY AND FIRST AID PROCEDURES

If acute overexposure to fumes occurs, remove victim from the adverse environment immediately and seek medical attention.

7. ADDITIONAL COMMENTS

NOTE: The percent composition reflects the range that is possible with this GROUP of products. These are not the technical specifications for a particular product. Actual composition will fall within this range, but will depend on specifications for the particular product. Thus, when welding or cutting products containing chromium or nickel (for example), the potential for exposure to chromium or nickel obviously increases as their percentage composition increases. Therefore, we strongly urge that all operations with potentially hazardous exposures be evaluated by a competent industrial hygienist. See Sections 4 & 5 for further information.

The steel itself presents no health hazard unless it is welded, burned, ground or cut. During these procedures it is possible that hazardous amounts of fume or dusts may be generated. It is advised that your particular operation be evaluated by a competent health professional to determine whether or not a hazard exists.

PREPARED UNDER DIRECTION OF: W.R. BELL

DATE: NOVEMBER 19, 1985

TELEPHONE NO. 216/441-6600

SUPERCEDES MSDS DATED: N/A

M A T E R I A L S A F E T Y D A T A

Chemtrec Chemical Transportation Emergency
Telephone No.: 800-424-9300; District of Columbia: 202-483-7616

Emergency
Telephone No. 412-339-5059

This MSDS applies to the following established steel grades, type, and/or trade named products:

GROUP 11: TOOL AND STAINLESS STEELS: A-2, S-7 TYPES: 316, 316L, 317, 317L, 317LX, 317LXN, 336, 337, 350, 444, 447, 448

1. HAZARDOUS INGREDIENTS

MATERIAL	% (RANGE)	ACGIH-TLV (Mg/M3)	OSHA-PEL (Mg/M3)	CAS #
Iron	> 50	5 (oxide fume)	10 (oxide fume)	7439-89-6
Chromium	0.9-30	0.5 (metal) 0.05 (Cr+6) Suspected carcinogen-NTP & IARC See Sections 5 & 7	1 (metal)	7740-47-3
Nickel	0.07-80.45	1 (metal) Suspected carcinogen-NTP & IARC See Sections 5 & 7	1 (metal)	7740-02-0
Manganese	0.14-2.15	5 (dust) 1 (fume)	5 (dust) 5 (fume)	7439-96-5
Silicon	0.12-1.1	10 (total dust) 5 (respirable dust)	15 (total dust) 5 (respirable dust)	7740-21-3
Cobalt	0.01-1.0	0.1 (0.05 intended change)	0.1	7740-48-4
Vanadium	0.10-1.1	0.05 (dust) 0.05 (fume) Values for V2O5	0.5 (dust) 0.1 (fume)	7740-02-2
Niobium/ Tantalum	0.002-4.15	5 (Ta)	5 (Ta)	7440-25-7

2. PHYSICAL DATA

Not Applicable.

3. FIRE AND EXPLOSION HAZARD DATA

Not Applicable.

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4. SPECIAL PROTECTION INFORMATION

VENTILATION: Local exhaust ventilation should be used to keep worker exposure below accepted exposure limits during welding and grinding operations.

RESPIRATORY PROTECTION: When engineering or administrative controls are not feasible to control overexposure or while they are being instituted, appropriate NIOSH approved respirators shall be used, and selected according to 29 CFR 1910.134.

EYE PROTECTION: Appropriate protective eye and face equipment shall be worn where there is a reasonable probability of injury that can be prevented by such equipment (such as welding, grinding).

PROTECTIVE GLOVES: Appropriate and as needed to protect against exposure to chemical or physical hazards.

OTHER: N/A

5. PHYSIOLOGICAL EFFECTS

PRIMARY ROUTE OF EXPOSURE

THRESHOLD LIMIT VALUE (TLV)

Inhalation of fumes from welding or burning; dusts from grinding or cutting.

N/A

EFFECTS OF OVEREXPOSURE

ACUTE: Excessive inhalation of fumes from many metals can produce an acute reaction known as "metal fume fever". Though metals such as copper and zinc have been most associated with metal fume fever, it is suspected by some authorities (Casarett and Doull's Toxicology: The Basic Science of Poisons; Hamilton and Hardy: Industrial Toxicology) that other metallic fumes may produce this condition. Symptoms consist of chills and fever (very similar to and easily confused with flu symptoms), which come on a few hours after large exposure. Long-term effects of metal fume fever have not been noted.

CHRONIC: Excessive and repeated inhalation of chromium fumes or dust may cause severe irritation, ulceration or cancer in the respiratory system - nose, throat and lungs. It is generally believed that the hexavalent forms of chromium (Cr+6) are responsible for these effects. It is uncertain whether metallic chromium in dust form can cause the same effects noted above. Until this issue is resolved, engineering controls or personnel protective equipment (i.e., respirators) should be utilized to assure exposures are not excessive. Similarly, excessive inhalation of nickel fumes have been associated with respiratory cancer. Both chromium and nickel are potential sensitizers, and may cause allergic reactions.

Only after six to ten years of exposure to iron dust or fume does one present any signs of pneumoconiosis. Physical examinations of those exposed to iron dust have not indicated any disability.

Excessive and prolonged inhalation of manganese (generally over 2 years exposure) can cause damage to the central nervous system. Specifically, the pathology resembles Parkinson's Disease.

Niobium is highly toxic once it reaches the blood stream. Because it is poorly absorbed, it is less toxic from the gastrointestinal tract. It has been reasonably concluded from animal studies that small additional amounts of niobium from industrial exposure may have adverse effects over the long term when added to the niobium consumed in the human diet, particularly when added to the respiratory tract.

Tantalum is inert toward body tissues and fluids and is consequently nontoxic after industrial exposure.

Pulmonary fibrosis was presented by some Russian workers, but there was no reference to tantalum concentrations or degree of exposure.

Vanadium dusts cause a persistent cough which develops after 5 hours of exposure and may last up to 10 days. Pulmonary irritation also results from vanadium, but there are no deviations in pulmonary function or other laboratory tests.

Cobalt causes a dermatitis of the allergic sensitivity type at points of friction. Cobalt toxicity also results in a progressive, diffuse, interstitial pneumonia with a nonproductive cough, dyspnea on exertion, interstitial fibrosis and cell damage. Other workers have experienced a sensitized respiratory disease characterized by cough, wheezing and shortness of breath where upon removal from the environment, the symptoms subsided.

6. EMERGENCY AND FIRST AID PROCEDURES

If acute overexposure to fumes occurs, remove victim from the adverse environment immediately and seek medical attention.

7. ADDITIONAL COMMENTS

NOTE: The percent composition reflects the range that is possible within this GROUP of products. These are not the technical specifications for a particular product. Actual composition will fall within this range, but will depend on specifications for the particular product. Thus, when welding or cutting products containing chromium or nickel (for example), the potential for exposure to chromium or nickel obviously increases as their percentage composition increases. Therefore, we strongly urge that all operations with potentially hazardous exposures be evaluated by a competent industrial hygienist. See Sections 4 & 5 for further information.

The steel itself presents no health hazard unless it is welded, burned, ground or cut. During these procedures it is possible that hazardous amounts of fume or dusts may be generated. It is advised that your particular operation be evaluated by a competent health professional to determine whether or not a hazard exists.

PREPARED UNDER DIRECTION OF: W.R. BELL

DATE: NOVEMBER 6, 1985

TELEPHONE NO. 216/441-6600

SUPERSEDES MSDS DATED: N/A

M A T E R I A L S A F E T Y D A T A

Chemtrec Chemical Transportation Emergency
Telephone No.: 800-424-9300; District of Columbia: 202-483-7616

Emergency
Telephone No. 412-339-5059

This MSDS applies to the following established steel grades, type, and/or trade named products:

GROUP III: TOOL AND STAINLESS STEELS: D-2, ONTARIO TYPES: 400, 403, 404, 405, 405NA, 406, 407, 408, 409, 410, 402, 410S, 410HC, 411, 412, 413, 419, 420, 425MOD, 430, 403TI, 430X, 431, 434, 435, 436, 439, 440A, 441, 446, 501, 502

1. HAZARDOUS INGREDIENTS

MATERIAL	% (RANGE)	ACGIH-TLV (Mg/M3)	OSHA-PEL (Mg/M3)	CAS #
Iron	> 50	5 (oxide fume)	10 (oxide fume)	7439-89-6
Chromium	4-27	0.5 (metal) 0.05 (CR+6) Suspected carcinogen-NTP & IARC See Sections 5 & 7	1 (metal)	7740-47-3
Nickel	0.09-1	1 (metal) Suspected carcinogen-NTP & IARC See Sections 5 & 7	1 (metal)	7740-02-0
Aluminum	0.002-4.25	10 (dust) 5 (welding fume)	N/A	7429-90-5
Manganese	0.12-1.5	5 (dust) 1 (fume)	5 (dust) 5 (fume)	7439-96-5
Molybdenum	0.14-1.5	5	5	7439-98-7
Silicon	0.14-1.0	10 (total dust) 5 (respirable dust)	15 (total dust) 5 (respirable dust)	7740-21-3
Titanium	0.001-1.10	5 (dust) (as TiO2)	15 (as TiO2)	7740-36-6
Vanadium	0.15-1.10	0.05 (dust) 0.05 (fume) Values for V2O5	0.5 (dust) 0.1 (fume)	7740-02-2

2. PHYSICAL DATA

Not applicable.

3. FIRE AND EXPLOSION HAZARD DATA

Not applicable.

DISCLAIMER

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The information contained in this Material Safety Data Sheet (MSDS) is believed to be correct, but no representations, guarantees or warranties of any kind are made as to its accuracy, suitability for particular application, hazards connected with the use of the material or the results obtained from the use thereof. User assumes all risk and liability of any use, processing or handling of any material. Variations in methods, conditions, equipment used to store, handle or process the material and hazards connected with the use of the material are solely the responsibility of the user and remain at its sole discretion.

As sold, the product described in this MSDS is considered by Metalsource to be an "article" within the meaning of Title 29 of the Code of Federal Regulations, Section 1910.1200 et seq. This MSDS is intended to be used solely for the purpose of satisfying informational requests made pursuant to that requirement. Compliance with all applicable federal, state, and local laws and regulations remains the responsibility of the user, and the user has the responsibility to provide a safe workplace, to examine all aspects of its operation, and to determine if or where precautions, in addition to those described herein, are or may be required.

4. SPECIAL PROTECTION INFORMATION

VENTILATION: Local exhaust ventilation should be used to keep worker exposure below accepted exposure limits during welding and grinding operations.

RESPIRATORY PROTECTION: When engineering or administrative controls are not feasible to control overexposure or while they are being instituted, appropriate NIOSH approved respirators shall be used, and selected according to 29 CFR 1910.134.

EYE PROTECTION: Appropriate protective eye and face equipment shall be worn where there is a reasonable probability of injury that can be prevented by such equipment (such as welding, grinding).

PROTECTIVE GLOVES: Appropriate and as needed to protect against exposure to chemical or physical hazards.

OTHER: N/A

5. PHYSIOLOGICAL EFFECTS

PRIMARY ROUTE OF EXPOSURE

THRESHOLD LIMIT VALUE (TLV)

Inhalation of fumes from welding or burning; dusts from grinding or cutting.

N/A

EFFECTS OF OVEREXPOSURE

ACUTE: Excessive inhalation of fumes from many metals can produce an acute reaction known as "metal fume fever". Though metals such as copper and zinc have been most associated with metal fume fever, it is suspected by some authorities (Casarett and Doull's Toxicology: The Basic Science of Poisons; Hamilton and Hardy: Industrial Toxicology) that other metallic fumes may produce this condition. Symptoms consist of chills and fever (very similar to and easily confused with flu symptoms), which come on a few hours after large exposures. Long-term effects of metal fume fever have not been noted.

CHRONIC: Excessive and repeated inhalation of chromium fumes or dust may cause severe irritation, ulceration or cancer in the respiratory system - nose, throat and lungs. It is generally believed that the hexavalent forms of chromium (Cr+6) are responsible for these effects. It is uncertain whether metallic chromium in dust form can cause the same effects noted above. Until this issue is resolved, engineering controls or personnel protective equipment (i.e., respirators) should be utilized to assure exposures are not excessive. Similarly, excessive inhalation of nickel fumes have been associated with respiratory cancer. Both chromium and nickel are potential sensitizers, and may cause allergic reactions.

Only after six to ten years of exposure to iron dust or fume does one present any signs of pneumoconiosis. Physical examinations of those exposed to iron dust have not indicated any disability.

Excessive and prolonged inhalation of manganese (generally over 2 years exposure) can cause damage to the central nervous system. Specifically, the pathology resembles Parkinson's Disease.

Titanium, its oxides and carbide are physiologically inert and present no adverse health effect.

Molybdenum is not foreseen as a hazard in the present context. Though molybdenum has caused toxicity (anemia and poor growth) in farm animals, there is not data documenting toxicity to humans due to industrial exposure.

Vanadium dusts cause a persistent cough which develops after 5 hours of exposure and may last up to 10 days. Pulmonary irritation also results from vanadium, but there are no deviations in pulmonary function or other laboratory tests.

6. EMERGENCY AND FIRST AID PROCEDURES

If acute overexposure to fumes occurs, remove victim from the adverse environment immediately and seek medical attention.

7. ADDITIONAL COMMENTS

NOTE: The percent composition reflects the range that is possible within this GROUP of products. These are not the technical specifications for a particular product. Actual composition will fall within this range, but will depend on specifications for the particular product. Thus, when welding or cutting products containing chromium or nickel (for example), the potential for exposure to chromium or nickel obviously increases as their percentage composition increases. Therefore, we strongly urge that all operations with potentially hazardous exposures be evaluated by a competent industrial hygienist. See Sections 4 & 5 for further information.

The steel itself presents no health hazard unless it is welded, burned, ground or cut. During these procedures it is possible that hazardous amounts of fume or dusts may be generated. It is advised that your particular operation be evaluated by a competent health professional to determine whether or not a hazard exists.

PREPARED UNDER DIRECTION OF: W.R. BELL

DATE: NOVEMBER 5, 1985

TELEPHONE NO. 216/441-6600

SUPERSEDES MSDS DATED: N/A

M A T E R I A L S A F E T Y D A T A

CHEMTREC CHEMICAL TRANSPORTATION EMERGENCY

TELEPHONE NO.: 800-424-9300; DISTRICT OF COLUMBIA: 202-463-7616

EMERGENCY

TELEPHONE NO. 412-339-5059

This MSDS applies to the following established steel grades, type, and/or trade named products:

GROUP IV: TOOL AND STAINLESS STEELS: 0-6 (OILGRAPH) AND TYPES: 902, 916, 905H, 905L, 918, 921

1. HAZARDOUS INGREDIENTS

MATERIAL	% (RANGE)	ACGIH-TLV (Mg/M3)	OSHA-PEL (Mg/M3)	CAS #
Iron	> 50	5 (oxide fume)	10 (oxide fume)	7739-89-6
Nickel	0.15-51.0	1 (metal)	1 (metal)	7740-02-0
Chromium	0.02-0.60	0.5 (metal) 0.05 (Cr+6) Suspected carcinogen-NTP & IARC See Sections 5 & 7	1 (metal)	7740-47-3
Silicon	0.10-1.4	10 (total dust) 5 (respirable dust)	15 (total dust) 5 (respirable dust)	7740-21-3
Manganese	0.33-1.25	5 (dust) 1 (fume)	5 (dust) 5 (fume)	7439-96-5

2. PHYSICAL DATA

Not Applicable.

3. FIRE AND EXPLOSION HAZARD DATA

Not Applicable.

4. SPECIAL PROTECTION INFORMATION

VENTILATION: Local exhaust ventilation should be used to keep worker exposure below accepted exposure limits during welding and grinding operations.

RESPIRATORY PROTECTION: When engineering or administrative controls are not feasible to control overexposure or while they are being instituted, appropriate NIOSH approved respirators shall be used, and selected according to 29 CFR 1910.134.

EYE PROTECTION: Appropriate protective eye and face equipment shall be worn where there is a reasonable probability of injury that can be prevented by such equipment (such as welding, grinding).

PROTECTIVE GLOVES: Appropriate and as needed to protect against exposure to chemical or physical hazards.

OTHER: N/A

DISCLAIMER

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The information contained in this Material Safety Data Sheet (MSDS) is believed to be correct, but no representations, guarantees or warranties of any kind are made as to its accuracy, suitability for particular application, hazards connected with the use of the material or the results obtained from the use thereof. User assumes all risk and liability of any use, processing or handling of any material. Variations in methods, conditions, equipment used to store, handle or process the material and hazards connected with the use of the material are solely the responsibility of the user and remain at its sole discretion.

As sold, the product described in this MSDS is considered by Metalsource to be an "article" within the meaning of Title 29 of the Code of Federal Regulations, Section 1910.1200 et seq. This MSDS is intended to be used solely for the purpose of satisfying informational requests made pursuant to that requirement. Compliance with all applicable federal, state, and local laws and regulations remains the responsibility of the user, and the user has the responsibility to provide a safe workplace, to examine all aspects of its operation, and to determine if or where precautions, in addition to those described herein, are or may be required.

5. PHYSIOLOGICAL EFFECTS

PRIMARY ROUTE OF EXPOSURE

Inhalation of fumes from welding or burning; dusts from grinding or cutting.

THRESHOLD OF VALUE (TLV)

N/A

EFFECTS OF OVEREXPOSURE

ACUTE: Excessive inhalation of fumes from many metals can produce an acute reaction known as "metal fume fever". Though metals such as copper and zinc have been most associated with metal fume fever, it is suspected by some authorities (Casarett and Doull's Toxicology: The Basic Science of Poisons; Hamilton and Hardy: Industrial Toxicology) that other metallic fumes may produce this condition. Symptoms consist of chills and fever (very similar to and easily confused with flu symptoms), which come on a few hours after large exposures. Long-term effects of metal fume fever have not been noted.

CHRONIC: Excessive and repeated inhalation of chromium fumes or dust may cause severe irritation, ulceration or cancer in the respiratory system - nose, throat and lungs. It is generally believed that the hexavalent forms of chromium (Cr+6) are responsible for these effects. It is uncertain whether metallic chromium in dust form can cause the same effects noted above. Until this issue is resolved, engineering controls or personnel protective equipment (i.e. respirators) should be utilized to assure exposures are not excessive. Similarly, excessive inhalation of nickel fumes have been associated with respiratory cancer. Both chromium and nickel are potential sensitizers, and may cause allergic reactions.

Only after six to ten years of exposure to iron dust or fume does one present any signs of pneumoconiosis. Physical examinations of those exposed to iron dust have not indicated any disability.

Excessive and prolonged inhalation of manganese (generally over 2 years exposure) can cause damage to the central nervous system. Specifically, the pathology resembles Parkinson's Disease.

6. EMERGENCY AND FIRST AID PROCEDURES

If acute overexposure to fumes occurs, remove victim from the adverse environment immediately and seek medical attention.

7. ADDITIONAL COMMENTS

NOTE: The percent composition reflects the range that is possible within this GROUP of products. These are not the technical specifications for a particular product. Actual composition will fall within this range, but will depend on specifications for the particular product. Thus, when welding or cutting products containing chromium or nickel (for example), the potential for exposure to chromium or nickel obviously increases as their percentage composition increases. Therefore, we strongly urge that all operations with potentially hazardous exposures be evaluated by a competent industrial hygienist. See Sections 4 & 5 for further information.

The steel itself presents no health hazard unless it is welded, burned, ground or cut. During these procedures it is possible that hazardous amounts of fume or dusts may be generated. It is advised that your particular operation be evaluated by a competent health professional to determine whether or not a hazard exists.

PREPARED UNDER DIRECTION OF: W.R. BELL

DATE: NOVEMBER 5, 1985

TELEPHONE NO. 216/441-6600

SUPERSEDES MSDS DATED: N/A



metalsource

An ALCO Standard Company

7500 Grand Division Avenue • Cleveland, Ohio 44125 • 216/441-6600

MATERIAL SAFETY DATA

Chemtrec Chemical Transportation Emergency
Telephone No. 800-424-9300; District of Columbia: 202-483-7616

Emergency
Telephone No. 412-339-5059

This MSDS applies to the following established steel grades, types, and/or trade named products:

GROUP V: STAINLESS STEEL TYPES 304N, 309, 309S, 310, 330, 362, 363

1. HAZARDOUS INGREDIENTS

MATERIAL	% (RANGE)	ACGIH-TLV (Mg/M3)	OSHA-PEL (Mg/M3)	CAS #
Chromium	3-29	0.5 (metal) 0.05 (Cr+6) Suspected Carcinogen-NTP & IARC See Sections 5 & 7	1(metal)	7740-47-3
Nickel	72 (min.)	1 (metal) Suspected Carcinogen-NTP & IARC See Sections 5 & 7	1 (metal)	7740-02-0
Cobalt	1 (max.)	0.1	0.1	7440-48-4
Manganese	2 (max.)	5 (dust) 1 (fume)	5 (dust) 5 (fume)	7439-96-5
Silicon	1.5 (max.)	10 (total dust) 5 (resp. dust)	15 (total dust) 5 (resp. dust)	7740-21-3
Aluminum	1 (max.)	10 (dust) 5 (welding fume)	N/A	7429-90-5
Titanium	0.6-2.75	5 (TiO2 dust)	15 (TiO2)	7740-36-6
Niobium	0.7-1.2	N/A	N/A	7440-25-7
Iron	6-10	5 (oxide fume)	10 (oxide fume)	7439-89-6

2. PHYSICAL DATA

Not Applicable.

3. FIRE AND EXPLOSION HAZARD DATA

Not Applicable.

DISCLAIMER

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As sold, the product described in this MSDS is considered by Metalsource to be an "article" within the meaning of Title 29 of the Code of Federal Regulations, Section 1910.1200 et seq. This MSDS is intended to be used solely for the purpose of satisfying informational requests made pursuant to that requirement. Compliance with all applicable federal, state, and local laws and regulations remains the responsibility of the user, and the user has the responsibility to provide a safe workplace, to examine all aspects of its operation, and to determine if or where precautions, in addition to those described herein, are or may be required.

4. SPECIAL PROTECTION INFORMATION

VENTILATION: Local exhaust ventilation should be used to keep worker exposure below accepted exposure limits during welding and grinding operations.

RESPIRATORY PROTECTION: When engineering or administrative controls are not feasible to control overexposure or while they are being instituted, appropriate NIOSH approved respirators shall be used, and selected according to 29 CFR 1910.134.

EYE PROTECTION: Appropriate protective eye and face equipment shall be worn where there is a reasonable probability of injury that can be prevented by such equipment (such as welding, grinding).

PROTECTIVE GLOVES: Appropriate and as needed to protect against exposure to chemical or physical hazards.

OTHER: N/A

5. PHYSIOLOGICAL EFFECTS

PRIMARY ROUTE OF EXPOSURE

THRESHOLD LIMIT VALUE (TLV)

Inhalation of fumes from welding or burning; dusts from grinding or cutting.

N/A

EFFECTS OF OVEREXPOSURE

ACUTE: Excessive inhalation of fumes of many metals may produce a reaction known as 'metal fume fever'. Metals such as zinc and copper have been most associated with this condition, but it is suspected that other metallic fumes may also produce it. Metal fume fever symptoms consist of chills and fever (similar to and easily confused with flu symptoms), which begin a few hours after large exposures. Long term-effects of metal fume fever have not been noted.

CHRONIC: Excessive inhalation of nickel fumes have been associated with respiratory cancer. Also, nickel is a potential sensitizer, and thus may cause allergic reactions.

6. EMERGENCY AND FIRST AID PROCEDURES

If acute overexposure to fumes occurs, remove victim from the adverse environment immediately and seek medical attention.

7. ADDITIONAL COMMENTS

NOTE: The percent composition reflects the range that is possible within this GROUP of products. These are not the technical specifications for a particular product. Actual composition will fall within this range, but will depend on specifications for the particular product. Thus, when welding or cutting products containing chromium or nickel (for example), the potential for exposure to chromium or nickel obviously increases as their percentage composition increases. Therefore, we strongly urge that all operations with potentially hazardous exposures be evaluated by a competent industrial hygienist. See Sections 4 & 5 for further information.

The steel itself presents no health hazard unless it is welded, burned, ground or cut. During these procedures it is possible that hazardous amounts of fume or dusts may be generated. It is advised that your particular operation be evaluated by a competent health professional to determine whether or not a hazard exists.

PREPARED UNDER DIRECTION OF: W.R. BELL

DATE: NOVEMBER 13, 1985

TELEPHONE NO.

216/441-6600

SUPERSEDES MSDS DATED: N/A

M A T E R I A L S A F E T Y D A T A

Chemtrec Chemical Transportation Emergency
Telephone No.: 800-424-9300; District of Columbia: 202-483-7616

Emergency
Telephone No. 412-339-5059

This MSDS applies to the following established steel grades, types, and/or trade named products:

GROUP VI: STAINLESS TYPES 317L, 317LX, 336, 337, 350, 444, 447, 448
ALLOY GRADES 4335MOD, 4340

1. HAZARDOUS INGREDIENTS

MATERIAL	% (RANGE)	ACGIH-TLV (Mg/M3)	OSHA-PEL (Mg/M3)	CAS #
Chromium	30 (max.)	0.5 (metal) 0.05 (Cr+6) Suspect Carcinogen--NTP & IARC See Sections 5 & 7	1 (metal)	7740-47-3
Nickel	2-80.45	1 (metal) Suspect Carcinogen--NTP & IARC See Sections 5 & 7	1 (metal)	7740-02-0
Molybdenum	0.75-10	5	5	7439-98-7
Manganese	2.15 (max.)	5 (dust) 1 (fume)	5 (dust) 5 (fume)	7439-96-5
Silicon	1 (max.)	10 (total dust) 5 (resp. dust)	15 (total dust) 5 (resp. dust)	7740-21-3
Cobalt	1 (max.)	0.1	0.1	7440-48-4
Niobium/Tantalum	0.05-4.15	5 (Ta)	5 (Ta)	7440-25-7
Vanadium	1.10 (max.)	0.05 (V2O5) (dust/fume)	0.5 (V2O5 dust) 0.1 (V2O5 fume)	7740-02-2
Iron	0-97.2	5 (oxide fume)	10 (oxide fume)	7439-89-6

2. PHYSICAL DATA

Not Applicable.

3. FIRE AND EXPLOSION HAZARD DATA

Not Applicable.

DISCLAIMER

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4. SPECIAL PROTECTION INFORMATION

VENTILATION: Local exhaust ventilation should be used to keep worker exposure below accepted exposure limits during welding and grinding operations.

RESPIRATORY PROTECTION: When engineering or administrative controls are not feasible to control overexposure or while they are being instituted, appropriate NIOSH approved respirators shall be used, and selected according to 29 CFR 1910.134.

EYE PROTECTION: Appropriate protective eye and face equipment shall be worn where there is a reasonable probability of injury that can be prevented by such equipment (such as welding, grinding).

PROTECTIVE GLOVES: Appropriate and as needed to protect against exposure to chemical or physical hazards.

OTHER: N/A

5. PHYSIOLOGICAL EFFECTS

PRIMARY ROUTE OF EXPOSURE

THRESHOLD LIMIT VALUE (TLV)

Inhalation of fumes from welding or burning; dusts from grinding or cutting.

N/A

EFFECTS OF OVEREXPOSURE

ACUTE: Excessive inhalation of fumes from many metals can produce an acute reaction known as "metal fume fever". Though metals such as copper and zinc have been most associated with metal fume fever, it is suspected by some authorities (Casarett and Doull's Toxicology: The Basic Science of Poisons; Hamilton and Hardy: Industrial Toxicology) that other metallic fumes may produce this condition. Symptoms consist of chills and fever (very similar to and easily confused with flu symptoms), which come on a few hours after large exposures. Long-term effects of metal fume fever have not been noted.

CHRONIC: Excessive inhalation of nickel fumes has been associated with respiratory cancer. Also, nickel is a potential sensitizer, and thus may cause allergic reactions.

Only after six to ten years of exposure to iron dust or fumes does one present any signs of pneumoconiosis. Physical examinations of those exposed to iron dust have not indicated any disability.

Excessive and prolonged inhalation of manganese (generally over 2 years exposure) can cause damage to the central nervous system. Specifically, the pathology resembles Parkinson's Disease.

Excessive exposures to aluminum fume and dust have been associated with lung disease, but this effect is probably due to the simultaneous silica exposure.

Industrial exposure to copper fumes, dusts or mists results in metal fume fever with atrophic changes in nasal mucous membranes. Chronic poisoning results in Wilson's disease, characterized by a hepatic cirrhosis, brain damage, demyelination, renal disease and copper deposition in the cornea.

6. EMERGENCY AND FIRST AID PROCEDURES

If acute overexposure to fumes occurs, remove victim from the adverse environment immediately and seek medical attention.

7. ADDITIONAL COMMENTS

NOTE: The percent composition reflects the range that is possible within this GROUP of products. These are not the technical specifications for a particular product. Actual composition will fall within this range, but will depend on specifications for the particular product. Thus, when welding or cutting products containing chromium (for example), the potential for exposure to chromium or nickel obviously increases as their percentage composition increases. Therefore, we strongly urge that all operations with potentially hazardous exposures be evaluated by a competent industrial hygienist. See Sections 4 & 5 for further information.

The steel itself presents no health hazard unless it is welded, burned, ground, or cut. During these procedures it is possible that hazardous amounts of fume or dusts may be generated. It is advised that your particular operation be evaluated by a competent health professional to determine whether or not a hazard exists.

PREPARED UNDER THE DIRECTION OF: W.R. BELL

DATE: NOVEMBER 12, 1985

TELEPHONE NO.

216/441-6600

SUPERSEDES MSDS DATED: N/A

MATERIAL SAFETY DATA

Chemtrec (National Transportation Emergency)
Telephone No.: 800-424-9300; District of Columbia: 202-837-0616

Emergency
Telephone No. 412-339-5059

This MSDS applies to the following established steel grades, types, and/or trade named products:

GROUP VII: TOOL AND STAINLESS STEEL: 91, 91-1, 91-2, 91-3, 91-4, 91-5, 91-6, 91-7, 91-8, 91-9, 91-10, 91-11, 91-12, 91-13, 91-14, 91-15, 91-16, 91-17, 91-18, 91-19, 91-20, 91-21, 91-22, 91-23, 91-24, 91-25, 91-26, 91-27, 91-28, 91-29, 91-30, 91-31, 91-32, 91-33, 91-34, 91-35, 91-36, 91-37, 91-38, 91-39, 91-40, 91-41, 91-42, 91-43, 91-44, 91-45, 91-46, 91-47, 91-48, 91-49, 91-50, 91-51, 91-52, 91-53, 91-54, 91-55, 91-56, 91-57, 91-58, 91-59, 91-60, 91-61, 91-62, 91-63, 91-64, 91-65, 91-66, 91-67, 91-68, 91-69, 91-70, 91-71, 91-72, 91-73, 91-74, 91-75, 91-76, 91-77, 91-78, 91-79, 91-80, 91-81, 91-82, 91-83, 91-84, 91-85, 91-86, 91-87, 91-88, 91-89, 91-90, 91-91, 91-92, 91-93, 91-94, 91-95, 91-96, 91-97, 91-98, 91-99, 91-100

1. HAZARDOUS INGREDIENTS

MATERIAL	% (RANGE)	ACGIH-TLV (MG/M3)	OSHA-PEL (Mg/M3)	CAS #
Nickel	30-31	1 (metal) Suspect Carcinogen - NTP & IARC See Sections 5 & 7	1 (metal)	77-00-02-0
Chromium	0.6 (max.)	0.5 (metal) 0.05 (Cr(VI)) Suspect Carcinogen-NTP & IARC See Sections 5 & 7	1 (metal)	7740-47-3
Manganese	1.25 (max.)	5 (dust) 1 (fume)	5 (dust) 5 (fume)	7439-96-5
Silicon	1.25 (max.)	10 (total dust) 5 (resp. dust)	15 (total dust) 5 (resp. dust)	7740-21-3
Iron	43-64.5	5 (oxide fume)	10 (oxide fume)	7439-89-6

2. PHYSICAL DATA

Not Applicable.

3. FIRE AND EXPLOSION HAZARD DATA

Not Applicable.

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The information contained in this Material Safety Data Sheet (MSDS) is believed to be correct, but no representations, guarantees or warranties of any kind are made as to its accuracy, suitability for particular application, hazards connected with the use of the material or the results obtained from the use thereof. User assumes all risk and liability of any use, processing or handling of any material. Variations in methods, conditions, equipment used to store, handle or process the material and hazards connected with the use of the material are solely the responsibility of the user and remain at its sole discretion.

As sold, the product described in this MSDS is considered by Metalsource to be an "article" within the meaning of Title 29 of the Code of Federal Regulations, Section 1910.1400 et seq. This MSDS is intended to be used solely for the purpose of satisfying informational requests made pursuant to that requirement. Compliance with all applicable federal, state, and local laws and regulations remains the responsibility of the user, and the user has the responsibility to provide a safe workplace, to examine all aspects of its operation, and to determine if or where precautions, in addition to those described herein, are or may be required.

4. SPECIAL PROTECTION INFORMATION

VENTILATION: Local exhaust ventilation should be used to keep worker exposure below accepted exposure limits during welding and grinding operations.

RESPIRATORY PROTECTION: When engineering or administrative controls are not feasible to control overexposure or while they are being instituted, appropriate NIOSH approved respirators shall be used, and selected according to 29 CFR 1910.134.

EYE PROTECTION: Appropriate protective eye and face equipment shall be worn where there is a reasonable probability of injury that could be prevented (e.g., welding, grinding).

PROTECTIVE GLOVES: Appropriate and adequate gloves protect against exposure to chemical or physical hazards.

OTHER: N/A

5. PHYSIOLOGICAL EFFECTS

PRIMARY ROUTE OF EXPOSURE

THRESHOLD LIMIT VALUE (TLV)

Inhalation of fumes from welding or burning; dusts from grinding or cutting.

N/A

EFFECTS OF OVEREXPOSURE

ACUTE: Excessive inhalation of fumes from many metals can produce an acute reaction known as "metal fume fever". Though metals such as copper and zinc have been most associated with metal fume fever, it is suspected by some authorities (Casarett and Doull's Toxicology: The Basic Science of Poisons; Hamilton and Hardy: Industrial Toxicology) that other metallic fumes may produce this condition. Symptoms consist of chills and fever (very similar to and easily confused with flu symptoms), which come on a few hours after large exposure. Long-term effects of metal fume fever have not been noted.

CHRONIC: Excessive inhalation of nickel fumes has been associated with respiratory cancer. Also, nickel is a potential sensitizer, and thus may cause allergic reactions. Excessive and prolonged inhalation of manganese (generally over 2 years exposure) can cause damage to the central nervous system. Specifically, the pathology resembles Parkinson's Disease.

Industrial exposure to copper fumes, dusts or mists results in metal fume fever with atrophic changes in nasal mucous membranes. Chronic poisoning results in Wilson's disease, characterized by a hepatic cirrhosis, brain damage, demyelination, renal disease and copper deposition in the cornea.

6. EMERGENCY AND FIRST AID PROCEDURES

If acute overexposure to fumes occurs, remove victim from the adverse environment immediately and seek medical attention.

7. ADDITIONAL COMMENTS

NOTE: The percent composition reflects the range that is possible within this GROUP of products. These are not the technical specifications for a particular product. Actual composition will fall within this range, but will depend on specifications for the particular product. Thus, when welding or cutting products containing chromium or nickel (for example), the potential for exposure to chromium or nickel obviously increases as their percentage composition increases. Therefore, we strongly urge that all operations with potentially hazardous exposures be evaluated by a competent industrial hygienist. See Sections 4 & 5 for further information.

The steel itself presents no health hazard unless it is welded, burned, ground, or cut. During these procedures it is possible that hazardous amounts of fume or dusts may be generated. It is advised that your particular operation be evaluated by a competent health professional to determine whether or not a hazard exists.

PREPARED UNDER DIRECTION OF: W.R. BELL

DATE: NOVEMBER 5, 1985

TELEPHONE NO. 441-6600

SUPERSEDES MSDS DATED: N/A

MATERIAL SAFETY DATA

Chemtrec Chemical Transportation Emergency
Telephone No.: 800-424-9300; District of Columbia: 202-483-7616

Emergency
Telephone No. 412-339-5059

This MSDS applies to the following established steel grades, types, and/or trade named products.

GROUP VIII: STAINLESS AND SPECIAL HIGH ALLOY STEELS: 904L, 13-8MO, 155PH, 15-7MO, 17-4, 17-7, MO-Metal, Waspalloy, 901

1. HAZARDOUS INGREDIENTS

MATERIAL	% (RANGE)	ACGIH-TLV (Mg/M3)	OSHA-PEL (Mg/M3)	CAS #
Chromium	2.25-23.0	0.5 (metal) 0.05 (Cr+6) Suspect Carcinogen-NTP & IARC See Sections 5 & 7	1 (metal)	7740-47-3
Nickel	3-77	1 (metal) Suspect Carcinogen-NTP & IARC See Sections 5 & 7	1 (metal)	7740-02-0
Cobalt	0.5-15	0.1	0.1	7740-48-4
Manganese	2 (max.)	5 (dust) 1 (fume)	5 (dust) 5 (fume)	7439-96-5
Molybdenum	2-10	5	5	7439-98-7
Copper	6 (max.)	0.2 (fume) 1 (dust)	0.1 (fume) 1 (dust)	7740-58-0
Silicon	1 (max.)	10 (total dust) 5 (resp. dust)	15 (total dust) 5 (resp. dust)	7740-21-3
Aluminum	0.05-1.6	10 (dust) 5 (welding fume)	N/A	7429-90-5
Titanium	0.05-3.2	5 (TiO2 dust)	15 (TiO2)	7740-36-6
Wolfram (Tungsten)	0.2-1	N/A	N/A	7440-33-7
Iron	0-92	5 (oxide fume)	10 (oxide fume)	7439-89-6

2. PHYSICAL DATA

Not applicable.

3. FIRE AND EXPLOSION HAZARD DATA

Not applicable.

DISCLAIMER

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As sold, the product described in this MSDS is considered by Metalsource to be an "article" within the meaning of Title 29 of the Code of Federal Regulations, Section 1910.1200 et seq. This MSDS is intended to be used solely for the purpose of satisfying informational requests made pursuant to that requirement. Compliance with all applicable federal, state, and local laws and regulations remains the responsibility of the user, and the user has the responsibility to provide a safe workplace, to examine all aspects of its operation, and to determine if or where precautions, in addition to those described herein, are or may be required.

4. SPECIAL PROTECTION INFORMATION

VENTILATION: Local exhaust ventilation should be used to keep worker exposure below accepted exposure limits during welding and grinding operations.

RESPIRATORY PROTECTION: When engineering or administrative controls are not feasible to control overexposure or while they are being instituted, appropriate NIOSH approved respirators shall be used, and selected according to 29 CFR 1910.134.

EYE PROTECTION: Appropriate protective eye and face equipment shall be worn where there is a reasonable probability of injury that can be prevented by such equipment (such as welding, grinding).

PROTECTIVE GLOVES: Appropriate and as needed to protect against exposure to chemical or physical hazards.

OTHER: N/A

5. PHYSIOLOGICAL EFFECTS

PRIMARY ROUTE OF EXPOSURE

THRESHOLD LIMIT VALUE (TLV)

Inhalation of fumes from welding or burning; dusts from grinding or cutting.

N/A

EFFECTS OF OVEREXPOSURE

ACUTE: Excessive inhalation of fumes from many metals can produce an acute reaction known as "metal fume fever". Though metals such as copper and zinc have been most associated with metal fume fever, it is suspected by some authorities (Casarett and Doull's Toxicology: The Basic Science of Poisons; Hamilton and Hardy: Industrial Toxicology) that other metallic fumes may produce this condition. Symptoms consist of chills and fever (very similar to and easily confused with flu symptoms), which come on a few hours after large exposures. Long-term effects of metal fume fever have not been noted.

CHRONIC: Excessive and repeated inhalation of chromium fumes and dust may cause irritation and ulceration of mucous membranes. Chromium fumes may also cause cancer in the respiratory system. It is generally believed that the hexavalent forms of chromium (Cr+6) are responsible for these effects. Also, chromium is a potential sensitizer, and thus may cause allergic reactions.

Only after six to ten years of exposure to iron dust or fumes does one present any signs of pneumoconiosis. Physical examinations of those exposed to iron dust have not indicated any disability.

Excessive and prolonged inhalation of manganese (generally over 2 years exposure) can cause damage to the central nervous system. Specifically, the pathology resembles Parkinson's Disease.

6. EMERGENCY AND FIRST AID PROCEDURES

If acute overexposure to fumes occurs, remove victim from the adverse environment immediately and seek medical attention.

7. ADDITIONAL COMMENTS

NOTE: The percent composition reflects the range that is possible within this GROUP of products. These are not the technical specifications for a particular product. Actual composition will fall within this range, but will depend on specifications for the particular product. Thus, when welding or cutting products containing chromium or nickel (for example), the potential for exposure to chromium or nickel obviously increases as their percentage composition increases. Therefore, we strongly urge that all operations with potentially hazardous exposures be evaluated by a competent industrial hygienist. See Sections 4 & 5 for further information.

The steel itself presents no health hazard unless it is welded, burned, ground or cut. During these procedures it is possible that hazardous amounts of fume or dusts may be generated. It is advised that your particular operation be evaluated by a competent health professional to determine whether or not a hazard exists.

PREPARED UNDER DIRECTION OF: W.R. BELL

DATE: NOVEMBER 6, 1985

TELEPHONE NO. 216/441-6600

SUPERSEDES MSDS DATED: N/A

MATERIAL SAFETY DATA

Chemtrec Chemical Transportation Emergency
Telephone No.: 800-424-9300; District of Columbia: 202-483-7616

Emergency
Telephone No. 412-339-5059

This MSDS applies to the following established steel grades, types, and/or trade named products:

GROUP IX: HIGH TEMPERATURE ALLOYS: Monel 400, Monel K500

1. HAZARDOUS INGREDIENTS

MATERIAL	% (RANGE)	ACGIH-TLV (Mg/M3)	OSHA-PEL (Mg/M3)	CAS #
Nickel	68 (max.)	1 (metal) Suspect Carcinogen - NTP & IARC See Sections 5 & 7	1 (metal)	7740-02-0
Manganese	1 (max.)	5 (dust) 1 (fume)	5 (dust) 5 (fume)	7439-96-5
Copper	29.5 (max.)	0.2 (fume) 1 (dust)	0.1 (fume) 1 (dust)	7740-58-0
Silicon	4 (max.)	10 (total dust) 5 (resp. dust)	15 (total dust) 5 (resp. dust)	7740-21-3
Aluminum	2.8 (max.)	10 (dust) 5 (welding fume)	N/A	7429-90-5
Iron	3 (max.)	5 (oxide fume)	10 (oxide fume)	7439-89-6

PHYSICAL DATA

Not Applicable.

3. FIRE AND EXPLOSION HAZARD DATA

Not Applicable.

4. SPECIAL PROTECTION INFORMATION

VENTILATION: Local exhaust ventilation should be used to keep worker exposure below accepted exposure limits during welding and grinding operations.

RESPIRATORY PROTECTION: When engineering or administrative controls are not feasible to control overexposure or while they are being instituted, appropriate NIOSH approved respirators shall be used, and selected according to 29 CFR 1910.134.

EYE PROTECTION: Appropriate protective eye and face equipment shall be worn where there is a reasonable probability of injury that can be prevented by such equipment (such as welding, grinding).

PROTECTIVE GLOVES: Appropriate and as needed to protect against exposure to chemical or physical hazards.

OTHER: N/A

DISCLAIMER

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5. PHYSIOLOGICAL EFFECTS

PRIMARY ROUTE OF EXPOSURE

Inhalation of fumes from welding or burning; dusts from grinding or cutting.

THRESHOLD LIMIT VALUE (TLV)

N/A

EFFECTS OF OVEREXPOSURE

ACUTE: Excessive inhalation of fumes from many metals can produce an acute reaction known as "metal fume fever". Though metals such as copper and zinc have been most associated with metal fume fever, it is suspected by some authorities (Casarett and Doull's Toxicology: The Basic Science of Poisons; Hamilton and Harlow's Industrial Toxicology) that other metallic fumes may produce this condition. Symptoms consist of chills and fever (very similar to and easily confused with flu symptoms), which come on a few hours after large exposure. Long-term effects of metal fume fever have not been noted.

CHRONIC: Excessive and repeated inhalation of chromium fumes or dust may cause severe irritation, ulceration or cancer in the respiratory system - nose, throat and lungs. It is generally believed that the hexavalent forms of chromium (Cr+6) are responsible for these effects. It is uncertain whether metallic chromium in dust form can cause the same effects noted above. Until this issue is resolved, engineering controls or personnel protective equipment (i.e., respirators) should be utilized to assure exposures are not excessive. Similarly, excessive inhalation of nickel fumes have been associated with respiratory cancer. Both chromium and nickel are potential sensitizers, and may cause allergic reactions.

Only after six to ten years of exposure to iron dust or fumes does one present any signs of pneumoconiosis. Physical examinations of those exposed to iron dust have not indicated any disability.

Excessive and prolonged inhalation of manganese (generally over 2 years exposure) can cause damage to the central nervous system. Specifically, the pathology resembles Parkinson's Disease.

Niobium is highly toxic once it reaches the blood stream. Because it is poorly absorbed, it is less toxic from the gastrointestinal tract. It has been reasonably concluded from animal studies that small additional amounts of niobium from industrial exposure may have adverse health effects over the long term when added to the niobium consumed in the human diet, particularly when added to the respiratory tract.

Tantalum is inert toward body tissues and fluids and is consequently nontoxic after industrial exposure. Pulmonary fibrosis was presented by some Russian workers, but there was no reference to tantalum concentrations or degree of exposure.

Molybdenum is not foreseen as a hazard in the present context. Though molybdenum has caused toxicity (anemia and poor growth) in farm animals, there is not data documenting toxicity to humans due to industrial exposure.

Vanadium dusts cause a persistent cough which develops after 5 hours of exposure and may last up to 10 days. Pulmonary irritation also results from vanadium, but there are no deviations in pulmonary function or other laboratory tests.

Cobalt causes a dermatitis of the allergic sensitivity type at points of friction. Cobalt toxicity also results in a progressive, diffuse, interstitial pneumonia with a nonproductive cough, dyspnea on exertion, interstitial fibrosis and cell damage. Other workers have experienced a sensitized respiratory disease characterized by cough, wheezing and shortness of breath where upon removal from the environment, the symptoms subside.

6. EMERGENCY AND FIRST AID PROCEDURES

If acute overexposure to fumes occurs, remove victim from the adverse environment immediately and seek medical attention.

7. ADDITIONAL COMMENTS

NOTE: The percent composition reflects the range that is possible within this GROUP of products. These are not the technical specifications for a particular product. Actual composition will fall within this range, but will depend on specifications for the particular product. Thus, when welding or cutting products containing chromium or nickel (for example), the potential for exposure to chromium or nickel obviously increases as their percentage composition increases. Therefore, we strongly urge that all operations with potentially hazardous exposures be evaluated by a competent industrial hygienist. See Sections 4 & 5 for further information.

The steel itself presents no health hazard unless it is welded, burned, ground or cut. During these procedures it is possible that hazardous amounts of fume or dusts may be generated. It is advised that your particular operation be evaluated by a competent health professional to determine whether or not a hazard exists.

PREPARED UNDER THE DIRECTION OF: W.R. BELL

DATE: NOVEMBER 8, 1985

TELEPHONE NO.

216/441-6600

SUPERSEDES MSDS DATED: N/A

M A T E R I A L S A F E T Y D A T A

Chemtrec Chemical Transportation Emergency
Telephone No.: 800-424-9300; District of Columbia: 202-483-7616

Emergency
Telephone No. 419/862-2745

This MSDS applies to the following established grades, types, and/or trade named products:

BERYLLIUM COPPER ALLOY 3, UNS NO. C 17510
BERYLLIUM COPPER ALLOY 25, 190, UNS C 17200

1. HAZARDOUS INGREDIENTS

HAZARDOUS INGREDIENTS			ACGIH-TLV (Mg/M3)		OSHA-PEL (Mg/M3)		
MATERIAL	CAS #	% (RANGE)	TLV	TLV-STEL	PEL	CEILING	PEAK
<u>For Alloy 25,190</u>							
Beryllium	7440-41-7	1.8-2.0	0.002	N/A	0.002	0.005	0.025
Copper (Fume)	7440-50-8	Balance	0.2	N/A	0.1	N/A	N/A
(Dust & Mist)			1.0	2.0	1.0	N/A	N/A
Cobalt	7440-48-4	0.2-0.35	0.1	N/A	0.1	N/A	N/A
<u>For Alloy 3 add the following:</u>							
Nickel Metal	7440-02-0	1.4-2.2	0.1	0.3	1.0	N/A	N/A
(Soluble)					1.0	N/A	N/A

KEY:

ACGIH = American Conference of Governmental Industrial Hygienists.

PEL = Eight Hour Average Permissible Exposure Limit.

Ceiling = Not to be exceeded except for peak limit.

Peak = 30 minute maximum duration concentration above limit.

TLV = Eight hour Average Threshold Limit Value.

TLV-STEL = 15 Minute short term exposure limit.

(C) = ACGIH Ceiling Limit - Not to be exceeded.

EPA EMISSION STANDARD (as Be)

0.01 Micrograms per cubic meter (30 day average) ambient air standard 10 grams/24 hours total site emission limit. NOTE: State and local regulations may vary.

2. PHYSICAL DATA

Not Applicable.

3. FIRE AND EXPLOSION HAZARD DATA

Not Applicable.

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4. SPECIAL PROTECTION INFORMATION

No protective equipment or clothing is required when handling solid forms. Approved high efficiency cartridge or supplied air respirator is required if beryllium in air concentrations exceeds OSHA standards.

When welding, heating and casting, dry grinding, dry sanding, polishing, or otherwise abrading the surface of beryllium alloys in a manner which generates finely divided particles, an exposure to airborne beryllium in excess of the occupational standard can occur. Under these conditions, local exhaust ventilation at the point of generation is the preferred method of control. The normal machining of beryllium alloys does not pose a problem of exposure to airborne beryllium; however, cast beryllium alloys must have the scale containing beryllium oxide, cleaned from the surface before machining to prevent potential exposure. Grinding or sanding operations under a liquid coolant do not pose an exposure potential; unless by recycling the liquid coolants, the concentrations of finely divided beryllium alloy reaches a point where particulate becomes airborne during its use. This source can be controlled by an in-line coolant centrifuge. Operations generating airborne beryllium must be air sampled to determine exposure levels. Where exposure data indicates, medical surveillance should be conducted.

5. PHYSIOLOGICAL EFFECTS

PRIMARY ROUTE OF EXPOSURE

THRESHOLD LIMIT VALUE (TLV)

Inhalation of fumes from welding or burning; dusts from grinding or cutting. Irritation of eyes from dusts and fumes.

N/A

EFFECTS OF OVEREXPOSURE

ACUTE: Dusts and fumes irritate the eyes, nose, and throat. Symptoms may include cough, metallic taste in the mouth, fever, fatigue, and nausea. CHRONIC: Inhalation may cause berylliosis, a serious chronic lung disease with cough, chest pain, shortness of breath, weight loss, weakness, and fatigue. FIRST AID: Remove from exposure and consult a physician. Prolonged skin contact with nickel may sensitize the skin and produce a rash.

Hazard communication regulations of the occupational safety and health administration require that caution labels for materials listed as potential carcinogens in either the International Agency for Cancer Research monograph series or the National Toxicology Program annual report on carcinogens must contain a cancer warning. Beryllium and nickel have been so listed based principally on animal tests and therefore, as shipped, this material bears a label identifying it as a potential cancer hazard.

6. EMERGENCY AND FIRST AID PROCEDURES

If acute overexposure to fumes occurs, remove victim from the adverse environment immediately to fresh air and seek medical attention.

7. ADDITIONAL COMMENTS

SPILL AND DISPOSAL PROCEDURES:

Beryllium containing scrap is normally recycled. In cases where this is not justified, solid material may be landfilled.

Because of the potential inhalation hazard inherent in the handling of fine, dust-like material (such as bag-house fines) it is recommended it be: (1) sealed in two plastic bags, (2) placed in a sound container, (3) labeled as a "beryllium containing material", and (4) shipped to either a recycling facility or an approved hazardous waste disposal site. If greater than one pound of such metal dust or powder is released into the environment, report the spill immediately to the National Response Center (800) 424-8802.

NOTE: The percent composition reflects the range that is possible within this GROUP of products. These are not the technical specifications for a particular product. Actual composition will fall within this range, but will depend on specifications for the particular product. Thus, when welding or cutting products containing manganese (for example), the potential for exposure to manganese obviously increases as their percentage composition increases. Therefore, we strongly urge that all operations with potentially hazardous exposures be evaluated by a competent industrial hygienist. See Sections 4 and 5 for further information.

The steel itself presents no health hazard unless it is welded, burned, ground, or cut. During these procedures it is possible that hazardous amounts of fume or dusts may be generated. It is advised that your particular operation be evaluated by a competent health professional to determine whether or not a hazard exists.

PREPARED UNDER DIRECTION OF: W.R. BELL

DATE: NOVEMBER 7, 1985

TELEPHONE NO. 216/441-6600

SUPERSEDES MSDS DATED: N/A

MATERIAL SAFETY DATA

Chemtrec Chemical Transportation Emergency
Telephone No.: 800-424-9300; District of Columbia: 202-483-7616

Emergency
Telephone No. 216/622-5000

This MSDS applies to the following established grades, types, and/or trade named products:

CATEGORY (1) DUCTILE IRON ASTM A-536 ALLOY DESIGNATIONS: Gr. 60-40-18/65-45-12/80-55-06/100-70-03/120-90-02

CATEGORY (2) GREY CAST IRON ASTM A-48 ALLOY DESIGNATIONS: CI-30, CI-30, 35, 40, 45, 50, 55

1. HAZARDOUS INGREDIENTS

-----PERMISSIBLE AIR LEVEL-----				
MATERIAL	CAS #	% (RANGE)	ACGIH-TLV (Mg/M3)	OSHA-PEL (Mg/M3)
Iron	7439-89-6	Balance	5 (fume)	10 (fume)
Chromium	7740-47-3	.01-18	.05 (Cr VI-Compounds)	0.1 (Cr VI-Compounds)
Nickel	7440-02-0	.01-4.5	1.0 (metal-insoluble compounds)	1.0 (metal-insoluble compounds)
Carbon	7440-44-0	1.0-4.5	N/A	N/A
Silicon	7740-21-3	.20-4.0	10 (total dust) 5 (resp. dust)	15 (total dust) 5 (resp. dust)
Molybdenum	7439-98-7	.01-2.5	5 (Soluble compounds) 10 (Insol. compounds)	5 (soluble compounds) 15 (Insol. compounds)
Manganese	7439-96-5	.20-1.3	1.0 (fume)	5.0 (ceiling value)
Copper	7440-50-8	.01-1.2	0.2 (fume)	0.1 (fume)
Titanium	7440-32-6	0.01-0.06	N/A	N/A
Aluminum	7429-90-5	0.01-0.05	N/A	10
Phosphorous	7423-14-0	0.01-0.8	.1	.1
Sulphur	7704-34-0	0.02-0.18	5	13 (sulphur dioxide)
Trace Elements	N/A	<1.0	N/A	N/A

NOTE: See additional comments on the back under item #7.

2. PHYSICAL DATA

Not Applicable.

3. FIRE AND EXPLOSION HAZARD DATA

Not Applicable.

DISCLAIMER

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4. SPECIAL PROTECTION INFORMATION

VENTILATION: Local exhaust should be used to keep worker exposure below accepted exposure limits during welding and grinding operations.

RESPIRATORY PROTECTION: When engineering or administrative controls are not feasible to control overexposure or while they are being instituted, appropriate NIOSH approved respirators shall be used, and selected according to 29 CFR 1910.134.

EYE PROTECTION: Appropriate protective eye and face equipment shall be worn when there is a reasonable probability of injury that can be prevented by such equipment (such as welding, grinding).

PROTECTIVE GLOVES: Appropriate and as needed to protect against exposure to chemical or physical hazards.

OTHER: N/A

5. PHYSIOLOGICAL EFFECTS

PRIMARY ROUTE OF EXPOSURE

THRESHOLD LIMIT VALUE (TLV)

Inhalation of fumes from welding or burning; dusts from grinding or cutting.

N/A

EFFECTS OF OVEREXPOSURE

ACUTE: Excessive inhalation of fumes from many metals can produce an acute reaction known as "metal fume fever". Though metals such as copper and zinc have been most associated with metal fume fever, it is suspected by some authorities (Casarett and Doull's Toxicology: The Basic Science of Poisons; Hamilton and Hardy: Industrial Toxicology) that other metallic fumes may produce this condition. Symptoms consist of chills and fever (very similar to and easily confused with flu symptoms), which come on a few hours after large exposures. Long-term effects of metal fume fever have not been noted.

CHRONIC: Only after six to ten years of exposure to iron dust or fume does one present any signs of pneumoconiosis. Physical examination of those exposed to iron dust have not indicated any disability.

Excessive or prolonged inhalation of manganese (generally over 2 years exposure) can cause damage to the central nervous system. Specifically, the pathology resembles Parkinson's Disease. Other chronic effects may include bronchitis and pneumonitis.

Excessive and repeated inhalation of chromium fumes or dust may cause severe irritation, ulceration or cancer in the respiratory system - nose, throat and lungs. It is generally believed that the hexavalent forms of chromium (Cr+6) are responsible for these effects. It is uncertain whether metallic chromium in dust form can cause the same effects noted above. Until this issue is resolved, engineering controls or personnel protective equipment (i.e., respirators) should be utilized to assure exposures are not excessive. Similarly, excessive inhalation of nickel fumes have been associated with respiratory cancer. Both chromium and nickel are potential sensitizers, and may cause allergic reactions.

Molybdenum is not foreseen as a hazard in the present context. Though molybdenum has caused toxicity (anemia and poor growth) in farm animals, there is not data documenting toxicity to humans due to industrial exposure.

Excessive exposures to aluminum fumes and dust have been associated with lung disease, but this effect is probably due to the simultaneous silica exposure.

Industrial exposure to copper fumes, dusts or mists results in metal fume fever with atrophic changes in nasal mucous membranes. Chronic poisoning results in Wilson's disease, characterized by a hepatic cirrhosis, brain damage, demyelination, renal disease and copper deposition in the cornea.

6. EMERGENCY AND FIRST AID PROCEDURES

If acute overexposure to fumes occurs, remove victim from the adverse environment immediately to fresh air and seek medical attention.

7. ADDITIONAL COMMENTS

NOTE: The percent composition reflects the range that is possible within this GROUP of products. These are not the technical specifications for a particular product. Actual composition will fall within this range, but will depend on specifications for the particular product. Thus, when welding or cutting products containing manganese (for example), the potential for exposure to manganese obviously increases as their percentage composition increases. Therefore, we strongly urge that all operations with potentially hazardous exposures be evaluated by a competent industrial hygienist. (See Sections 4 & 5 for further information.)

The steel itself presents no health hazard unless it is welded, burned, ground or cut. During these procedures it is possible that hazardous amounts of fume or dusts may be generated. It is advised that your particular operation be evaluated by a competent health professional to determine whether or not a hazard exists.

PREPARED UNDER DIRECTION OF: W.R. BELL

DATE: NOVEMBER 6, 1985

TELEPHONE NO. 216/441-6600

SUPERSEDES MSDS DATED: N/A

MATERIAL SAFETY DATA

Chemtec Chemical Transportation Emergency
Telephone No.: 800-424-9300; District of Columbia: 202-483-7616

Emergency
Telephone No. 415-271-5391

This MSDS applies to the following established steel grades, type and/or trade named products:

ALUMINUM ALLOYS - ALL FORMS 1XXX THROUGH 7XXX SERIES

1. HAZARDOUS INGREDIENTS

BASE METAL	CAS NUMBER	% COMPOSITION BY WEIGHT (RANGE)	1984-85 ACGIH TLV (Mg/M3)*	OSHA-PEL (Mg/M3)
Aluminum	7429-90-5	80.0-99.7	10.0 as metal dust and oxide 5.0 as welding fume	Not established Not established
Cobalt, Co	7440-48-4	1.0-10.0	0.1	0.1
Copper, Cu	7440-50-8	1.0-10.0	0.2, as fume	0.1, as fume
Iron, Fe	1309-37-1	1.0-10.0	5.0, as fume	10.0, as fume
Magnesium, Mg	1309-48-4	1.0-10.0	10.0, as fume	15.0, as fume
Manganese, Mn	7439-96-5	1.0-20.0	1.0, as fume	5.0 Ceiling
Silicon, Si	7440-21-3	1.0-20.0	10.0, as total dust 5.0, as resp. dust	Not established Not established
Tin, Sn	7440-31-5	1.0-10.0	2.0, as oxide and metal	2.0 as inorganic compounds
Zinc, Zn	1314-13-2	1.0-10.0	5.0, as fume	5.0, as fume

KEY: *TLV = Threshold-Limit-Value

NOTE: Aluminum alloys may be comprised of all or variations of the alloys shown here. In addition, the welding of aluminum alloys may produce the products listed in Section VII, #7.

2. PHYSICAL DATA

Not Applicable.

3. FIRE AND EXPLOSION HAZARD DATA

Not Applicable.

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4. SPECIAL PROTECTION INFORMATION

VENTILATION: Local exhaust ventilation should be used to keep worker exposure below accepted exposure limits during welding and grinding operations.

RESPIRATORY PROTECTION: When engineering or administrative controls are not feasible to control overexposure or while they are being instituted, appropriate NIOSH approved respirators shall be used, and selected according to 29 CFR 1910.134.

EYE PROTECTION: Appropriate protective eye and face equipment shall be worn where there is a reasonable probability of injury that can be prevented by such equipment (such as welding, grinding).

PROTECTIVE GLOVES: Appropriate and as needed to protect against exposure to chemical or physical hazards.

OTHER: N/A

5. PHYSIOLOGICAL EFFECTS

PRIMARY ROUTE OF EXPOSURE

THRESHOLD LIMIT VALUE (TLV)

Inhalation of fumes from welding or burning; dusts from grinding or cutting.

N/A

EFFECTS OF OVEREXPOSURE

ACUTE: Excessive inhalation of fumes from many metals can produce an acute reaction known as "metal fume fever". Though metals such as copper and zinc have been most associated with metal fume fever, it is suspected by some authorities (Casarett and Doull's Toxicology: The Basic Science of Poisons; Hamilton and Hardy: Industrial Toxicology) that other metallic fumes may produce this condition. Symptoms consist of chills and fever (very similar to and easily confused with flu symptoms), which come on a few hours after large exposures. Long-term effects of metal fume fever have not been noted.

CHRONIC: Excessive exposures to aluminum fume and dust have been associated with lung disease, but this effect is probably due to the simultaneous silica exposure. Excessive and prolonged inhalation of manganese (generally over 2 years exposure) can cause damage to the central nervous system. Specifically, the pathology resembles Parkinsons Disease. Cobalt causes a dermatitis of the allergic sensitivity type at points of friction. Cobalt toxicity also results in a progressive, diffuse, interstitial pneumonia with a nonproductive cough, dyspnea on exertion, interstitial fibrosis and cell damage. Other workers have experienced a sensitized respiratory disease characterized by cough, wheezing and shortness of breath where upon removal from the environment, the symptoms subside.

The toxicity of inorganic tin compounds is generally low. Exposure to the dust or fumes of tin oxides can result in a benign pneumoconiosis called stannosis. No tissue reaction or pulmonary dysfunction has been associated with this lung condition.

Only after six to ten years of exposure to iron dust or fume does one present any signs of pneumoconiosis. Physical examinations of those exposed to iron dust have not indicated any disability.

6. EMERGENCY AND FIRST AID PROCEDURES

If acute overexposure to fumes occurs, remove victim from the adverse environment immediately and seek medical attention.

7. ADDITIONAL COMMENTS

NOTE: The percent composition reflects the range that is possible within this GROUP of products. These are not the technical specifications for a particular product. Actual composition will fall within this range, but will depend on specifications for the particular product. Thus, when welding or cutting products containing chromium or nickel (for example), the potential for exposure to chromium or nickel obviously increases as their percentage composition increases. Therefore, we strongly urge that all operations with potentially hazardous exposures be evaluated by a competent industrial hygienist. See Sections 4 & 5 for further information.

The aluminum itself presents no health hazard unless it is welded, burned, ground, or cut. During these procedures it is possible that hazardous amounts of fume or dusts may be generated. It is advised that your particular operation be evaluated by a competent health professional to determine whether or not a hazard exists.

1. Halogen acids and sodium hydroxide in contact with aluminum may generate explosive mixtures of hydrogen.
2. Finely divided aluminum will form explosive mixtures in air. It will also form explosive mixtures in air in the presence of bromates, iodates, or ammonium nitrate.
3. When remelting aluminum scrap, entrapped moisture or the presence of strong oxidizers such as ammonium nitrate could cause an explosion. This applies to the collection of moisture in saw cavities as well. Moisture must be driven off prior to remelting.
4. Do not touch cast aluminum metal or heated aluminum product without knowing metal temperature. Aluminum experiences no color change during heating. If metal is hot and touched, burns can result.
5. Aluminum powder must be packaged and shipped as a Flammable Solid, UN1396.
6. Hard alloy ingots in the 2000 and 7000 series must be stress-relieved to prevent explosion when sawed.
7. The welding of aluminum alloys may generate carbon monoxide, carbon dioxide, ozone, nitrogen oxides, infra-red radiation and ultra-violet radiation.

PREPARED UNDER DIRECTION OF: W.R. BELL

DATE: NOVEMBER 6, 1985

TELEPHONE NO. 216/441-6600

SUPERSEDES MSDS DATED: N/A

MATERIAL SAFETY DATA

Division Chemical Transportation Emergency

Telephone No. 800-42-4300, District of Columbia: 202-493-7616

Emergency

Telephone No. 412-338-5039

This MSDS applies to the following established steel grades, types, and/or trade named products:

ALLOY STEELS - ALL FORMS INCLUDING NAK-55, NAK-80 (WELDING ROD), PDS-5, CARBON, STAINLESS, ALLOY & TOOL STEELS NOT LISTED ELSEWHERE.

1. HAZARDOUS INGREDIENTS

MATERIAL	CAS NUMBER	MAX. P. (WEIGHT)	ACGIH-TLV (Mg/M3)	OSHA-PEL (Mg/M3)
Base Metals:				
Iron (Fe)	7439-89-6	Balance	5 (oxide fume)	10 (Iron Oxide Fume)
Alloying Elements:				
Carbon (C)	7440-44-0	1.5	None Listed	None Listed
Manganese (Mn)	7439-96-5	32.0	5 (dust) 1 (fume)	5
Phosphorus (P)	7723-14-0	1.5	0.1	0.1
Sulfur (S)	7704-34-9	0.4	5	13 (Sulfur Dioxide)
Silicon (Si)	7740-21-3	4.0	10 (total dust) 5 (respirable dust)	10 (total dust) 5 (respirable dust)
Chromium	7740-47-3	11.5	0.5 (metal) 0.05 (Cr+6) Suspect carcinogen -NTP & IARC See sections 5 & 7	1
Molybdenum (Mo)	7439-98-7	2.0	5	15 (Insoluble Compounds)
Copper (Cu)	7740-58-0	2.0	0.2 (Cu Fume)	0.1 (Fume), 1 (Dust)
Nickel (Ni)	7740-02-0	45.0	1 (Soluble Nickel Compounds) Suspect carcinogen-NTP & IARC See Sections 5 & 7	1
Vanadium (V)	7740-02-2	5.0	0.05 (V2O5) (dust/fume)	0.5 (dust) 0.1 (fume)
Aluminum (Al)	7429-90-5	1.3	10 (dust) 5 (welding fume)	None Listed
Niobium (Nb)		0.3	5 (Ta)	None Listed
Boron (B)	7440-42-8	0.1	10 (oxide)	15 (oxide)
Titanium (Ti)	7440-36-6	3.0	15 (Ti oxide) 10 (total dust)	15 (Dioxide)
Nitrogen (N)		0.025	9	9 (Dioxide) 29 (Trifluoride)
Tantalum (Ta)	7440-25-7	0.01	5	5
Cobalt (Co)	7440-48-4	0.02	0.1	0.1 (Metal Fume & Dust)
Lead (Pb)	7439-92-1	0.5	15 (inorganic lead compounds, dust, and fume)	0.05
Tungsten (W)	7440-33-7	7.0	5 (10 STEL)	5 (Insoluble) 1 (soluble)
Calcium (Ca)	1305-78-8	0.05	5 (oxide)	5 (as Oxide)
Arsenic (As)	7440-38-2	0.01	0.2	0.01
Zirconium (Zr)	7440-67-7	0.2	5	5
Antimony (Sb)	7440-36-0	0.01	0.5	0.5
Zinc (Zn)	7440-66-6	0.01	5 (oxide fume)	5 (oxide fume)
Tin (Sn)	7440-31-5	0.04	2.0 (oxide & inorganic compounds)	2
Rare Earths (Ce)	N.A.	0.03	None Listed	None Listed
Coatings:				
Iron (Fe)	7439-89-6	2.1	5 (oxide fume)	10 (Oxide Fume)
Phosphorus (P)	7723-14-0	0.22	0.1	0.1
Silicon (Si)	7740-21-3	1.0	10 (total dust) 5 (respirable dust)	10 (total dust) 5 (respirable dust)
Chromium (Cr)	7740-47-3	0.05	0.5 (metal) 0.05 (Cr+6) Suspect carcinogen NTP & IARC See Sections 5 & 7	1
Nickel (Ni)	7740-58-0	1.3	1 (Sol. nickel compounds) suspect carcinogen NTP & IARC See Sections 5 & 7	1
Aluminum (Al)	7429-90-5	11.0	10 (dust) 5 (Welding fume)	None Listed
Lead (Pb)	7439-92-1	12.0	15 (inorganic lead compounds, dust, and fume)	0.05
Antimony (Sb)	7440-36-0	0.08	0.5	0.5
Zinc (Zn)	7440-66-6	36.0	5 (oxide fume)	5 (oxide fume)
Tin (Sn)	7440-31-5	1.4	2.0 (oxide & inorganic compounds)	2
Magnesium (Mg)	7439-95-4	0.04	10.0	15 (oxide fume)
Cadmium (Cd)	7440-43-9	0.02	0.05 (0.2 STEL) (dust)	0.02

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2. PHYSICAL DATA	Not Applicable.
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3. FIRE AND EXPLOSION HAZARD DATA	Not Applicable.
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4. SPECIAL PROTECTION INFORMATION

VENTILATION: Local exhaust ventilation should be used to keep worker exposure below accepted exposure limits during welding and grinding operations.

RESPIRATORY PROTECTION: When engineering or administrative controls are not feasible to control overexposure or while they are being instituted, appropriate NIOSH approved respirators shall be used, and selected according to 29 CFR 1910.134.

EYE PROTECTION: Appropriate protective eye and face equipment shall be worn where there is a reasonable probability of injury that can be prevented by such equipment (such as welding, grinding).

PROTECTIVE GLOVES: Appropriate and as needed to protect against exposure to chemical or physical hazards.

OTHER: N/A

5. PHYSIOLOGICAL EFFECTS

PRIMARY ROUTE OF EXPOSURE

THRESHOLD LIMIT VALUE (TLV)

Inhalation of fumes from welding or burning; dusts from grinding or cutting.

N/A

EFFECTS OF OVEREXPOSURE

ACUTE: Excessive inhalation of fumes from many metals can produce an acute reaction known as "metal fume fever". Though metals such as copper and zinc have been most associated with metal fume fever, it is suspected by some authorities (Casarett and Doull's Toxicology: The Basic Science of Poisons; Hamilton and Hardy; Industrial Toxicology) that other metallic fumes may produce this condition. Symptoms consist of chills and fever (very similar to and easily confused with flu symptoms), which come on a few hours after large exposures. Long-term effects of metal fume fever have not been noted.

CHRONIC: Excessive inhalation of nickel fumes has been associated with respiratory cancer. Also, nickel is a potential sensitizer, and thus may cause allergic reactions.

Only after six to ten years of exposure to iron dust or fumes does one present any signs of pneumoconiosis. Physical examinations of those exposed to iron dust have not indicated any disability.

Excessive and prolonged inhalation of manganese (generally over 2 years exposure) can cause damage to the central nervous system. Specifically, the pathology resembles Parkinson's Disease.

Excessive exposures to aluminum fume and dust have been associated with lung disease, but this effect is probably due to the simultaneous silica exposure.

Industrial exposure to copper fumes, dusts or mists results in metal fume fever with atrophic changes in nasal mucous membranes. Chronic poisoning results in Wilson's disease, characterized by a hepatic cirrhosis, brain damage, demyelination, renal disease and copper deposition in the cornea.

Excessive and prolonged overexposure to cobalt may cause an asthma-like disease with cough and dyspnea.

6. EMERGENCY AND FIRST AID PROCEDURES

If acute overexposure to fumes occurs, remove victim from the adverse environment immediately and seek medical attention.

7. ADDITIONAL COMMENTS

NOTE: The percent composition reflects the range that is possible within this GROUP of products. These are not the technical specifications for a particular product. Actual composition will fall within this range, but will depend on specifications for the particular product. Thus, when welding or cutting products containing chromium (for example), the potential for exposure to chromium or nickel increases as their percentage composition increases. Therefore, we strongly urge that all operations with potentially hazardous exposures be evaluated by a competent industrial hygienist. See Sections 4 & 5 for further information.

The stock itself presents no health hazard unless it is welded, burned, ground, or cut. During these procedures it is possible that hazardous amounts of fume or dusts may be generated. It is advised that your particular operation be evaluated by a competent health professional to determine whether or not a hazard exists.

PREPARED UNDER THE DIRECTION OF: W.H. BELL

DATE: NOVEMBER 12, 1985

TELEPHONE NO. 214/441-6600

SUPERSEDES MSDS DATED: N/A

7500 Grand Division Avenue • Cleveland, Ohio 44125 • 216/441-6600

ALCO Standard Company
metalsource



LEADER COPPER PRODUCTS COMPANY
COPPER NUMBER - COPRO-00-0065

4. FIRE AND EXPLOSION HAZARD DATA

HAZARDOUS INGREDIENTS				
MATERIAL	CAS NUMBER	EXPOSURE FORM	ACGIH-TLV (1)	OSHA-PEL (2)
Aluminum	(7429-90-5)	(Dust)	10	20
Antimony	(7440-36-0)	(Fume)	5	--
Arsenic	(7440-38-2)	(Dust)	0.02	0.5
Beryllium	(7440-41-7)	(Dust)	0.002	0.002
Cadmium	(7440-43-9)	(Dust)	0.05	0.2
Chromium	(7440-47-3)	(Fume)	0.05	0.1
Cobalt	(7440-48-4)	(Dust)	0.1	0.1
Copper	(7440-50-8)	(Dust)	1	1
Iron	(7439-37-1)	(Fume)	5	10
Lead	(7439-92-1)	(Dust)	0.15	0.05
Manganese	(7439-96-5)	(Dust)	5	5
Nickel	(7440-02-0)	(Fume)	1	1
Phosphorus	(7723-14-0)	(Total Dust)	0.01	0.01
Silicon	(7440-21-3)	(Total Dust)	10	10 (total dust)
Silver	(7440-22-4)	(Resp. Dust)	5	5 (resp. dust)
Sulphur (yellow)	(7704-34-9)	(Dust)	0.1	0.01
Tellurium	(7440-80-9)	(Dust)	5	13
Tin	(7440-31-5)	(Dust)	2	2
Zinc	(7440-13-2)	(Dust)	5 (as zinc oxide)	5
Zirconium	(7440-67-7)	(Fume)	5	10

HAZARDOUS DECOMPOSITION OR BYPRODUCTS: Metals, metal fumes.				
INCOMPATIBILITY (MATERIALS TO AVOID): Acids, bases, and oxidizers.				
OTHER: N/A				

Emergency Telephone: 800-441-6600 (toll-free) or 216-441-6600 (local)
Telephone: 216-441-6600
Emergency: 216-441-6600

THIS MSDS APPLIES TO COPPER/COPPER ALLOYS LISTED IDENTIFIED BY UNIVERSAL NUMERICAL SYSTEM (UNS) NUMBER AS LISTED IN APPENDIX "A" ATTACHED HERETO.

4. SPECIAL PROTECTION INFORMATION

VENTILATION: Local exhaust ventilation should be used to keep worker exposure below accepted exposure limits during welding and grinding operations.

RESPIRATORY PROTECTION: When engineering or administrative controls are not feasible to control overexposure or while they are being instituted, appropriate NIOSH approved respirators shall be used, and selected according to the purpose of the work.

EYE PROTECTION: Appropriate protective eye and face equipment shall be worn where there is a reasonable probability of injury that can be prevented by such equipment (such as welding, grinding).

PROTECTIVE CLOTHING: Appropriate and as needed to protect against exposure to chemical or physical hazards.

STABILITY: Stable

CONDITIONS TO AVOID: Stable under normal conditions of transport and storage. Molten metal may react violently with water.

INCOMPATIBILITY (MATERIALS TO AVOID): Acids, bases, and oxidizers.

OTHER: N/A

3. FIRE AND EXPLOSION HAZARD DATA

SPECIAL FIRE FIGHTING PROCEDURES: Solid massive form is not combustible. Fire and explosion hazards are moderate when material is in the form of dust and exposed to heat, flames, chemical reaction, or in contact with powerful oxidizers. Use special mixtures of dry chemical or sand. Firefighters should wear self-contained breathing apparatus and protective clothing.

2. PHYSICAL DATA

Not Applicable.

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HAZARDOUS INGREDIENTS				
MATERIAL	CAS NUMBER	EXPOSURE FORM	ACGIH-TLV (1)	OSHA-PEL (2)
Aluminum	(7429-90-5)	(Dust)	10	20
Antimony	(7440-36-0)	(Fume)	5	--
Arsenic	(7440-38-2)	(Dust)	0.02	0.5
Beryllium	(7440-41-7)	(Dust)	0.002	0.002
Cadmium	(7440-43-9)	(Dust)	0.05	0.2
Chromium	(7440-47-3)	(Fume)	0.05	0.1
Cobalt	(7440-48-4)	(Dust)	0.1	0.1
Copper	(7440-50-8)	(Dust)	1	1
Iron	(7439-37-1)	(Fume)	5	10
Lead	(7439-92-1)	(Dust)	0.15	0.05
Manganese	(7439-96-5)	(Dust)	5	5
Nickel	(7440-02-0)	(Fume)	1	1
Phosphorus	(7723-14-0)	(Total Dust)	0.01	0.01
Silicon	(7440-21-3)	(Total Dust)	10	10 (total dust)
Silver	(7440-22-4)	(Resp. Dust)	5	5 (resp. dust)
Sulphur (yellow)	(7704-34-9)	(Dust)	0.1	0.01
Tellurium	(7440-80-9)	(Dust)	5	13
Tin	(7440-31-5)	(Dust)	2	2
Zinc	(7440-13-2)	(Dust)	5 (as zinc oxide)	5
Zirconium	(7440-67-7)	(Fume)	5	10

5. PHYSIOLOGICAL EFFECTS

PRIMARY ROUTE OF EXPOSURE

Inhalation of fumes from welding, heating or burning; dusts from grinding, buffing or cutting.

THRESHOLD LIMIT VALUE (TLV)

N/A

EFFECTS OF OVEREXPOSURE

ACUTE: Extensive inhalation of fumes from many metals can produce an acute reaction known as "metal fume fever". Though metals such as copper and zinc have been most associated with metal fume fever, it is suspected by some authorities (Casarett and Doull's Toxicology: The Basic Science of Poisoning; Hamilton and Hardy: Industrial Toxicology) that other metallic fumes may produce this condition. Symptoms consist of chills and fever, which are similar to and easily confused with the infection, which sets in a few hours after fumes are inhaled. The effects of metal fume fever have not been noted.

ALUMINUM: Extensive exposure to aluminum fume and dust has been associated with lung disease, but this effect is probably due to simultaneous silica exposure.

ANTIMONY: Antimony and its compounds are irritating to the skin and mucous membranes and are systemic poisons. Effects are reported to include metallic taste in the mouth, vomiting, colic, loss of appetite and weight, and diarrhea. In addition, dermatitis may result which starts as an inflammation of the hair follicles and can progress through pus formation and sloughing to leave a contracted scar.

BERYLLIUM: Inhalation of beryllium dust or fume may result in the produce of an acute or chronic systematic disease depending upon the level of exposure and the beryllium compound involved. Granulomatous lesions of the skin, liver, kidneys, spleen, and lymph nodes have been reported.

Damage to the lungs may be in both the acute and chronic forms, both of which have similar signs and symptoms. These include a relatively non-productive cough, progressive difficulty in breathing, loss of appetite, and loss of weight. The major difference between the two is the suddenness of onset and the rate of progression. In the acute form, the symptoms appear in several hours to several weeks after exposure and there is usually rapid progression of signs including dyspnea, anorexia, and extreme weight loss. Complete recovery is possible and fatal cases usually result from acute heart disease. In chronic beryllium disease, the symptoms or signs are generally delayed in their onset and are persistent in nature. They may be triggered or aggravated by stresses such as pregnancy, respiratory infection, and thyrotoxicosis. In the progression of the disease, symptoms of heart disease may occur.

Beryllium is also a suspected human carcinogen and has caused cancer in laboratory animals.

CADMIUM: Inhalation of cadmium fumes may cause respiratory irritation with a sore, dry throat and a metallic taste followed by a cough, chest pain, and difficulty in breathing. Bronchitis, pneumonitis, and pulmonary edema have been reported as a result of the irritation of the fumes. Headaches, dizziness, loss of appetite, and weight loss have also been reported and the liver, kidneys and bone marrow may be injured by the presence of the metal.

Continued exposure to lower levels of cadmium has resulted in chronic poisoning characterized by irreversible lung damage and kidney damage. A single, high level exposure to cadmium can cause severe lung irritation which may be fatal. Cadmium is also a suspected human carcinogen.

CHROMIUM: In some workers, chromium compounds act as allergens and may cause dermatitis and may also produce pulmonary sensitization. Chromic acid and chromates have a direct corrosive effect on the skin and the mucous membranes of the upper respiratory tract. Although rare, there may be the possibility of skin and pulmonary sensitization.

IARC has determined that there is sufficient evidence of increased lung cancer among workers in the chromate producing industry and possible chromium alloy workers. This determination is supported by sufficient evidence for carcinogenicity to animals and possible mutagenicity testing of Cr VI compounds.

COBALT: Cobalt has been reported as causing hypersensitization type dermatitis in individuals who are susceptible. Animal studies have shown that particulate cobalt is an acutely irritating substance and industrial exposures, possibly combined with small amounts of silica, are reported capable of producing serious pneumoconiosis which is initially of an insidious nature.

COPPER: Melting, grinding, cutting of copper may produce fumes or dust exposure and breathing these fumes or dust may present potentially significant health hazards. Fumes of copper may cause metal fume fever with flu-like symptoms and skin and hair discoloration. While industrial dermatitis has not been reported, keratinization of the hands and the soles of the feet has been reported. Systematically as well, copper dust and fume cause irritation of the upper respiratory tract, metallic taste in the mouth, and nausea.

IRON: The inhalation of iron oxide fumes or dust may cause an apparent benign pneumoconiosis which is called siderosis. This disease is reported to be disabling, but makes x-ray diagnosis of other lung conditions difficult or impossible.

LEAD - SHORT TERM EXPOSURE: Lead is an accumulative poison. Inhalation effects of exposure to fumes or dust of inorganic lead may not develop quickly. Symptoms may include decreased physical fitness, fatigue, sleep disturbance, headache, aching bones and muscles, constipation, abdominal pains, and decreasing appetite. The effects are reversible and complete recovery is possible. Inhalation of large amounts of lead may lead to seizures, coma and death.

LEAD - LONG TERM EXPOSURE: Long term exposure can result in a buildup of lead in the body and more severe symptoms. These include anemia, pale skin, a blue line at the gum margin, decreased handgrip strength, abdominal pain, severe constipation, nausea, vomiting, and paralysis of the wrist joint. Prolonged exposure may also result in kidney damage. If the nervous system is affected, usually due to very high exposures, the resulting effects include severe headache, convulsions, coma, delirium, and death. Alcohol ingestion and physical exertion may bring on symptoms. Continued exposure can result in decreased fertility and/or increased changes of miscarriage or birth defects.

MANGANESE: Chronic manganese poisoning may result from inhalation of dust or fume. The central nervous system is the chief site of the injury. Chronic manganese poisoning is not a fatal disease although it is extremely disabling. Some individuals may be hypersusceptible to manganese. Freshly formed manganese fume has caused fever and chills similar to metal fume fever.

NICKEL: The most common ailment arising from contact with nickel or its compounds is an allergic dermatitis known as "nickel itch" which usually occurs when the skin is moist. Generally nickel and most salts of nickel do not cause systemic poisoning, but nickel has been identified as a suspected carcinogen.

SILICON: Accumulation in lungs may be responsible for benign pneumoconiosis, but is not considered to be responsible for pulmonary functional impairment or respiratory symptoms.

TIN: The inhalation of inorganic tin fumes or dust may cause an apparent benign pneumoconiosis called stannosis which is reported not to be disabling.

ZINC (AS OXIDE): Zinc is very low in toxicity but inhalation of fumes may cause "metal fume fever". Onset of symptoms may be delayed 4-12 hours and include irritation of the nose, mouth and throat, cough, stomach pain, headache, nausea, vomiting, metallic taste, chills, fever, pains in the muscles and joints, thirst, bronchitis or pneumonia and a bluish tint to the skin. These symptoms go away in 24-48 hours and leave no effect.

NOTE: Antimony trioxide, beryllium, cadmium, chromium, cobalt-chromium alloy, lead and nickel have been identified as potential human carcinogens.

6. EMERGENCY AND FIRST AID PROCEDURES

If acute overexposure to fumes occurs, remove victim from the adverse environment immediately and seek medical attention. **EYE CONTACT:** Flush well with running water to remove particulate. Get medical attention.

SKIN CONTACT: Vacuum off excess dust. Wash well with soap and water. **INGESTION:** Seek medical attention if large quantities of material have been ingested.

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: No special precautions are necessary for spills of bulk material. If large quantities of dust are spilled, remove by vacuuming or wet sweeping to prevent heavy concentration of airborne dust. If liquids (acids or bases) containing solubilized metal are spilled evacuate unprotected personnel from area. Absorb liquid by means of vermiculite, dry sand or similar material. Follow federal, state, and local regulations concerning the disposal of waste.

WASTE DISPOSAL METHOD: Dispose of in accordance with federal, state, and local regulations. Cleanup personnel should wear respirators and protective clothing. Ventilate area of release.

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING: Store material away from incompatible materials and keep dust from sources of ignition.

TELEPHONE NO.	216/441-6600	SUPERSEDED MSDS DATED: N/A
PREPARED UNDER DIRECTION OF:	M. R. BELL	DATE: NOVEMBER 30, 1985

[illegible]

104000	Medium Lead Brass	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
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APPENDIX "A" - MSDS-22 (continued)

Copper Alloy UNS No.	Name	Copper %	Zinc %	Lead %	Tin %	Phosphorus %	Arsenic %	Iron %	Antimony %	Aluminum %
C34200	High Leaded Brass	64.00	34.00	2.00	-	-	-	-	-	-
C34500	High Leaded Brass	63.00	35.25	1.75	-	-	-	-	-	-
C35000	Medium Leaded Brass	62.00	36.90	1.10	-	-	-	-	-	-
C35300	High Leaded Brass	61.50	36.70	1.80	-	-	-	-	-	-
C35600	Extra High Leaded Brass	62.50	35.00	2.50	-	-	-	-	-	-
C36000	Free Cutting Brass	61.50	35.25	3.25	-	-	-	-	-	-
C36500	Leaded Muntz Metal	60.00	39.35	0.65	-	-	-	-	-	-
C37000	Free Cutting Muntz Metal	60.00	35.00	1.00	-	-	-	-	-	-
C37700	Forging Brass	60.00	38.00	2.00	-	-	-	-	-	-
C38500	Architectural Bronze	57.00	40.00	3.00	-	-	-	-	-	-
C41100	Bearing Bronze	90.00	9.50	-	0.50	-	-	-	-	-
C42500	Contact Bronze	88.50	9.30	-	2.00	0.20	-	-	-	-
C43500	Trumpet Metal	81.00	18.10	-	0.90	-	-	-	-	-
C44300	Arsenical Admiralty	71.00	27.96	-	1.00	-	0.04	-	-	-
C44400	Antimonial Admiralty	71.00	28.00	-	1.00	-	-	-	-	-
C44500	Phosphorized Admiralty	71.00	27.96	-	1.00	0.04	-	-	-	-
C46200	Naval Brass	63.50	35.75	-	0.75	-	-	-	-	-
C46400	Naval Brass	60.00	39.25	-	0.75	-	-	-	-	-
C46500	Arsenical Naval Brass	60.00	35.70	-	0.80	-	0.06	-	-	-
C46700	Leaded Naval Brass	60.00	38.55	0.70	0.75	-	-	-	-	-
C46500	Leaded Naval Brass	60.00	37.50	1.75	0.75	-	-	-	-	-
C50500	Phosphor Bronze (E)	88.70	-	-	1.30	0.16	-	-	-	-
C51000	Phosphor Bronze (A)	94.80	-	-	5.00	0.20	-	-	-	-
C51800	Phosphor Bronze	95.60	-	-	4.20	0.20	-	-	-	-
C52100	Phosphor Bronze (C)	91.75	-	-	8.00	0.25	-	-	-	-
C52400	Phosphor Bronze (D)	89.75	-	-	10.00	0.25	-	-	-	-
C53400	Phosphor Bronze (A-1)	93.90	-	1.00	5.00	0.10	-	-	-	-
C54400	Phosphor Bronze (B-2)	87.90	4.00	4.08	4.00	0.10	-	-	-	-
C61000	Aluminum Bronze	92.00	-	-	-	-	-	-	-	8.00
C61400	Aluminum Bronze (B)	90.25	-	-	-	-	-	2.75	-	7.00

The above analyses have not been performed by or for The Metalsource Corporation. For each alloy the composition has been furnished to Metalsource by our suppliers. Percentages shown are intended for the purposes of MSDS only and do not represent data to be used for design and/or specification purposes. Neither is any of the above information to be construed as modify our standard Trade Customs and Conditions of Sale as imprinted on the face and reverse of our invoices.

MATERIAL SAFETY DATA SHEET

Chemical Emergency
 Telephone No.: 800-44-5300; 216-441-6600

Emergency
 Telephone No.: 216/421-5000

This MSDS applies to the following established steel grades, type, and/or trade named products:

HIGH NICKEL ALLOYS: SUPER STAINLESS ALLOYS: HIGH PERFORMANCE-HEAT RESISTANT ALLOYS: HIGH PERFORMANCE-CORROSION RESISTANT ALLOYS: HASTELLOY: FERRALUM - AS LISTED IN TABLE "A" BELOW.

1. HAZARDOUS INGREDIENTS

MATERIAL	C.A.S. #	ACGIH-TLV (Mg/M ³)	OSHA-PEL (Mg/M ³)
Nickel	7440-02-0	1.0	1.0
Cobalt	7440-48-4	.1	.1
Chromium	7440-47-3	.5	1.0
Molybdenum	7439-98-7	10.0 (20.0 STEL)	15.0
Wolfram ⁽³⁾	7440-33-7	5.0 (10.0 STEL)	None
Iron	7439-37-1	5.0 (oxide fume)	10.0
Silicon	7409-21-3	10.0 total dust 5.0 respirable dust	None
Manganese	7439-96-5	5.0 Dust Ceiling 1.0 Fume (3.0 STEL)	5.0 Ceiling
Vanadium	7440-62-2	.05 as V ₂ O ₅ (Dust & Fume)	.5 Dust Ceiling (V ₂ O ₅) .1 Fume Ceiling (V ₂ O ₅)
Titanium	7440-32-6	None	None
Aluminum	7429-90-5	10.0 Dust (20.0 STEL) 5.0 Fume	None
Copper	7440-50-8	1.0 Dust (2.0 STEL) .2 Fume	1.0 Dust .1 Fume
Columbium	7440-03-1 ⁽²⁾	None	None
Tantalum	7440-25-1 ⁽²⁾	5	5
Boron	7440-42-5	None	None
Carbon	7440-44-0	None	None

(1) See listing for each grade in Appendix "A" below.

(2) Columbium & Tantalum

(3) Tungsten

TABLE "A"

SUPER ALLOYS

CHEMICAL COMPOSITION PERCENT

	Hastelloy Alloy B-2	Hastelloy Alloy C-276	Hastelloy Alloy C-4	Cabot Alloy #635	Hastelloy Alloy G-3	Hastelloy Alloy X	Cabot Alloy #200	Cabot Alloy #201	Cabot Alloy #400	Cabot Alloy #600	Cabot Alloy #B10	Cabot Alloy #R00H	Cabot Alloy #B75	Ferralum Alloy #255	Hastelloy Alloy #N-532
Nickel	69	57	65	62	44	47	95.2	99	66.5	72	32.5	32.5	42	5.5	26
Cobalt	1.0 ^a	2.5 ^a	2.0 ^a	1.0 ^a	5.0 ^a	1.5	-	-	1.0 ^a	1.0 ^a	2.0 ^a	2.0 ^a	2.0 ^a	-	-
Chromium	1.0 ^a	15.5	16	21.5	22	22	-	-	-	15.5	21	21	21.5	26	22
Molybdenum	28	16	15.5	9.0	7.0	5.0	-	-	-	-	-	-	3.0	3.1	5.0
Wolfram	-	4.0	-	-	-	.6	-	-	-	-	-	-	-	-	-
Iron	2.0 ^a	5.5	3.0 ^a	5.0 ^a	19.5	18.5	.40 ^a	.40 ^a	1.5	8.0	44	44	29	62	BAL
Silicon	.10 ^a	.08 ^a	.08 ^a	.5	1.0 ^a	1.0 ^a	.15 ^a	.15	.50 ^a	.50 ^a	1.0 ^a	1.0 ^a	.50	1.0 ^a	1.0 ^a
Manganese	1.0 ^a	1.0 ^a	1.0 ^a	.5	1.0 ^a	-	.35 ^a	.35 ^a	1.25	1.0 ^a	1.5 ^a	1.5	1.0 ^a	1.5 ^a	2.5 ^a
Carbon	-	-	-	-	-	-	-	-	-	-	-	-	-	-	.05 ^a
Vanadium	-	.35 ^a	-	-	-	-	-	-	-	-	-	-	-	-	-
Titanium	-	-	.7 ^a	.4 ^a	-	.15 ^a	.10 ^a	.10 ^a	-	.30 ^a	.38	.38	1.0	-	4X ^a
Aluminum	-	-	-	.4 ^a	-	.5 ^a	-	-	.50 ^a	.35 ^a	.38	.38	.20 ^a	-	-
Copper	-	-	-	-	2.0	.5	.25 ^a	.25 ^a	31	.50 ^a	.75 ^a	.75	2.2	1.7	-
Other	-	-	-	3.7 ⁽¹⁾	.5	.008 ^a	-	-	-	-	-	-	-	-	-
Specified	-	-	-	Co-Ta ⁽¹⁾	Co-Ta ⁽¹⁾	Co-Ta ⁽¹⁾	-	-	-	-	-	-	-	-	-
Density (x dw/in)	.333	.321	.312	.305	.300	.297	.321	.321	.319	.304	.287	.287	.294	.282	
Melting Point (°F)	~2375	2415~2420	~2420	~2350	~2300	2300	2615	2615	2370	2470	2475	~2475	2500	~2600	

^a = Maximum ^b = Minimum

^c = Nickel + Cobalt

⁽¹⁾ Columbium & Tantalum

⁽²⁾ Boron

Cabot and Hastelloy are registered trademarks of Cabot Corporation

FERRALUM is a registered trademark of Bonar Langley Alloys Ltd.

2. PHYSICAL DATA

Not Applicable.

3. FIRE AND EXPLOSION HAZARD DATA

SPECIAL FIRE FIGHTING PROCEDURES: If this material is reduced to a powdered form, caution must be used to prevent fire or explosion. To extinguish a metal powder fire, use dry sand, dry graphite, or other Class "D" fire extinguishing powder.

HAZARDOUS DECOMPOSITION PRODUCTS: Various elemental metals and oxides may be generated from melting or gross handling operations. Refer to Section 1, for permissible exposure limits.

DISCLAIMER

By furnishing Material Safety Data Sheets, THE METALSOURCE CORPORATION, MAKES NO WARRANTY, expressed or implied, beyond those contained in our Standard Terms, Conditions and Limitations of Sale as published on the face and reverse of all invoices including, but not limited to, implied warranties of merchantability and/or fitness for a particular purpose.

The information contained in this Material Safety Data Sheet (MSDS) is believed to be correct, but no representations, warranties or undertakings of any kind are made as to its accuracy, suitability for particular application, appropriateness for use in the field or the results to be obtained from the use thereof. Users are urged to exercise caution in the use of this material and to consult with a competent industrial hygienist or other qualified person in the use of this material and to determine if or where precautions, in addition to those described herein, are or may be required.

As stated, the product covered by this MSDS is only defined by Metalsource to be an "article" within the meaning of Title 29 of the Code of Federal Regulations, Section 1910.120 et seq. This MSDS is intended to be used solely for the purpose of satisfying informational requests made pursuant to that requirement. Compliance with all applicable federal, state, and local laws and regulations remains the responsibility of the user, and the user has the responsibility to provide a safe workplace, to examine all aspects of its operation, and to determine if or where precautions, in addition to those described herein, are or may be required.

4. SPECIAL PROTECTION INFORMATION

VENTILATION: Local exhaust ventilation should be used to keep worker exposure below accepted exposure limits during welding and grinding operations.

RESPIRATORY PROTECTION: When engineering or administrative controls are not feasible to control overexposure or while they are being instituted, appropriate NIOSH approved respirators shall be used, and selected according to 29 CFR 1910.134.

EYE PROTECTION: Appropriate protective eye and face equipment shall be worn where there is a reasonable probability of injury that can be prevented by such equipment (such as welding, grinding).

PROTECTIVE GLOVES: Appropriate and as needed to protect against exposure to chemical or physical hazards.

OTHER: N/A

5. PHYSIOLOGICAL EFFECTS

PRIMARY ROUTE OF EXPOSURE

THRESHOLD LIMIT VALUE (TLV)

Inhalation of fumes from welding or burning; dusts from grinding or cutting.

N/A

Skin contact with this material may cause in some sensitive individuals an allergic response if such elements as chrome, cobalt, copper, and nickel are present. In the form of metal dust or powder, skin contact or abrasion may also cause irritation or dermatitis.

EFFECTS OF OVEREXPOSURE

ACUTE: Excessive inhalation of fumes from many metals can produce all acute reactions such as metal fume fever. Though metals such as copper and zinc have not been associated with acute metal fume fever, they are listed by the authorities (Casarett and Doull's Toxicology: The Basic Science of Poisons, Harcourt and Harcourt, "Industrial Hygiene") that other metallic fumes may produce this condition. Symptoms consist of chills and fever, sometimes an itchy and easily confused with flu symptoms), which come on a few hours after large exposures. Common effects of metal fume fever have not been noted.

CHRONIC: Excessive and repeated inhalation of chromium fumes or dust may cause severe irritation, ulceration or cancer in the respiratory system (nose, throat and lungs). It is generally believed that the hexavalent form of chromium (Cr⁶⁺) are responsible for these effects. It is uncertain whether metallic chromium or dust form can cause the same effects noted above, until this issue is resolved, engineering controls or personal protective equipment (i.e., respirators) should be utilized to assure exposures are not excessive. Similarly, excessive inhalation of nickel fumes have been associated with respiratory cancer. Both chromium and nickel are potential sensitizers, and may cause allergic reactions.

Only after six to ten years of exposure to iron dust or fume does one present any signs of pneumoconiosis. Physical examinations of those exposed to iron dust have not indicated any disability.

ALUMINUM: Excessive exposure to aluminum fume and dust has been associated with lung disease, but this effect is probably due to simultaneous silica exposure.

CHADRIUM: In some workers, chromium compounds act as allergens and may cause dermatitis and may also produce pulmonary sensitization. Chronic acid and chromates have a direct corrosive effect on the skin and the mucous membranes of the upper respiratory tract. Although rare, there may be the possibility of skin and pulmonary sensitization.

IAAC has determined that there is sufficient evidence of increased lung cancer among workers in the chrome-producing industry and possible chromium alloy workers. This determination is supported by sufficient evidence for carcinogenicity to animals and possible mutagenicity testing of Cr VI compounds.

COBALT: Cobalt has been reported as causing hypersensitization and dermatitis in individuals who are susceptible. Animal studies have shown that particulate cobalt is an acutely irritating substance and industrial exposures, possibly combined with small amounts of silica, are reported capable of producing serious pneumoconiosis which is initially of an insidious nature.

COPPER: Melting, grinding, cutting of copper may produce fumes or dust exposure and breathing these fumes or dust may present potentially significant health hazards. Fumes of copper may cause metal fume fever with flu-like symptoms and skin and hair discoloration, while industrial dermatitis has not been reported. Irritation of the hands and the soles of the feet has been reported. Systemically as well, copper dust and fume cause irritation of the upper respiratory tract, metallic taste in the mouth, and nausea.

IRON: The inhalation of iron oxide fumes or dust may cause an apparent benign pneumoconiosis which is called siderosis. This disease is reported to be disabling, but makes a ray diagnosis of other lung conditions difficult or impossible.

MANGANESE: Excessive and prolonged inhalation of manganese (generally over 2 years exposure) can cause damage to the central nervous system. Specifically, the pathological resembles Parkinson's Disease.

NIOBYENIUM: It is not known as a hazard in the present context. Though niobium has caused toxicity (anemia and poor growth) in farm animals, there is no data documenting toxicity to humans due to industrial exposure.

NICKEL: The most common ailment arising from contact with nickel or its compounds is an allergic dermatitis known as "nickel itch" which usually occurs when the skin is moist. Generally nickel and most salts of nickel do not cause systematic poisoning, but nickel has been identified as a suspected carcinogen.

SILICON: Accumulation in lungs may be responsible for benign pneumoconiosis, but not considered to be responsible for pulmonary functional impairment or respiratory symptoms.

TANTALUM: Metallic tantalum and its oxides have a relatively low order of toxicity. Although some animal experiments have suggested that inhalation of Ta or its oxides may produce benign and nonfibrotic pulmonary effects, no adverse effects have been reported as a result of industrial exposures. There have been some reports of adverse skin reactions due to tantalum, however, most evidence indicates that Ta is relatively inert with respect to skin contact.

TITANIUM: Its oxides and carbide are physiologically inert and present no adverse health effects.

VANADIUM: Dusts cause a persistent cough which develops after 5 hours of exposure and may last up to 10 days. Pulmonary irritation also results from vanadium, but there are no deviations in pulmonary function or other laboratory tests.

ZINC (AS OXIDE): Zinc is very low in toxicity but inhalation of fumes may cause "metal fume fever". Onset of symptoms may be delayed 4-12 hours and include irritation of the nose, mouth and throat, cough, stomach pain, headache, nausea, vomiting, metallic taste, chills, fever, pains in the muscles and joints, thirst, bronchitis or pneumonia and a bluish tint to the skin. These symptoms go away in 24-48 hours and leave no effect.

NOTE: Antimony, trioxide, beryllium, calcium, diuranium, cobalt-chromium alloy, lead and nickel have been identified as potential human carcinogens.

6. EMERGENCY AND FIRST AID PROCEDURES

If acute overexposure to fumes occurs, remove victim from the adverse environment immediately and seek medical attention.

7. ADDITIONAL COMMENTS

NOTE: The percent composition reflects the range that is possible within this GROUP of products. These are not the technical specifications for a particular product. Actual composition will fall within this range, but will depend on specifications for the particular product. Thus, when welding or cutting products containing chromium or nickel (for example), the potential for exposure to chromium or nickel obviously increases as their percentage composition increases. Therefore, we strongly urge that all operations with potentially hazardous exposures be evaluated by a competent industrial hygienist. See Section 4 & 5 for further information.

RESPIRATORY PROTECTION: If exposure above the PEL or TLV, NIOSH approved respirators for fume or dust, dependent upon the source of airborne contaminant.

VENTILATION: Required if dust or fume created in handling or working on this material.

LOCAL EXHAUST: Required if dust or fume created in handling or working on this material.

MECHANICAL (GENERAL): As above to reduce airborne dust or fume levels.

PROTECTIVE GLOVES: Required for melt, grind, cut or weld operations. Select glove approved for specific operation.

EYE PROTECTION: Required for melt, grind, cut or weld operations. Minimum requirement of safety glasses with side shields for these operations. Melting and welding may require special eye protection including face shields and specialty tinted glass. Grinding operations may also require face shields.

OTHER PROTECTIVE CLOTHING OR EQUIPMENT: As required for the work done or with the metal.

WORK/HYGIENE PRACTICES: As required for the work done with lead bearing materials. Meet requirements of the OSHA lead standard where necessary. Always evaluate the jobs done on this product in accordance with OSHA or relevant state, federal, or local standards.

The material itself presents no health hazard unless it is welded, burned, ground, or cut. During these procedures it is possible that hazardous amounts of fume or dusts may be generated. It is advised that your particular operation be evaluated by a competent health professional to determine whether or not a hazard exists.

PREPARED UNDER DIRECTION OF: W.R. BELL

DATE: November 30, 1985

TELEPHONE NO.

216/441-6600

SUPERSEDES MSDS DATED: N/A

MATERIAL SAFETY DATA

Chemtrec Chemical Transportation Emergency
Telephone No.: 800-424-9300; District of Columbia: 202-483-7616

Emergency
Telephone No. 216/622-5000

This MSDS applies to the following established steel grades, types, and/or trade named products:

CARBON ALUMINUM COATED STEEL PRODUCTS: COILS, SHEETS, STRIP & PLATE (GALVALLUME)

1. HAZARDOUS INGREDIENTS

-----PERMISSIBLE AIR LEVEL-----				
MATERIAL	CAS #	% (RANGE)	ACGIH-TLV (Mg/M3)	OSHA-PEL (Mg/M3)
Iron	7439-89-6	Balance	5 (oxide fume)	10 (oxide fume)
Carbon	7440-44-0	.01-1.2	Not Listed	Not Listed
Manganese	7439-96-5	.25-2.0	5 (dust)	5 (ceiling limit)
Chromium	7740-47-3	.01-2.0	.05 (Cr VI-Compounds)	0.1 (Cr - Metal)
Nickel	7740-02-0	.01-1.0	1	1
Copper	7740-58-0	.01-1.0	0.2 (fume)	0.2 (fume)
Trace Elements	N/A	<2.0	N/A	N/A
Metallic Coating:				
Aluminum	7429-90-05	50-60	5 (fume)	N/A
Zinc	7440-66-6	40 (min)	5 (oxide fume)	5 (oxide fume)
Silicon	7740-21-3	1.5-2.0	10 (total dust) 5 (respirable dust)	15 (total dust) 5 (respirable dust)
Trace Elements	N/A	<1.0	N/A	N/A

(OPTIONAL): Light surface coating of petroleum oil, greased edges, chromatic treatment of phosphate, borax and stearate soaps. The possible presence of these coatings should be considered when evaluating employee health hazards and exposures during welding or other dust/fume generating activities. Use of gloves is recommended to prevent skin irritation.

NOTE: See additional comments on the back under item #7.

DISCLAIMER

By furnishing Material Safety Data Sheets THE METALSOURCE CORPORATION MAKES NO WARRANTIES, expressed or implied, beyond those contained in our Standard Terms, Customs, and Conditions of Sale as published on the Face and Reverse of all invoices including, but not limited to, implied warranties of merchantability and/or fitness for a particular purpose.

The information contained in this Material Safety Data Sheet (MSDS) is believed to be correct, but no representations, guarantees or warranties of any kind are made as to its accuracy, suitability for a particular application, hazard connected with the use of material or the results to be obtained from the use thereof. User assumes all risk and liability of any use, processing or handling of any material. Variations in methods, conditions, equipment used to store, handle or process the material and hazards connected with the use of the material are solely the responsibility of the user and remain at its sole discretion.

As sold, the product described in this MSDS is considered by Metalsource to be an "article" within the meaning of Title 29 of the Code of Federal Regulations, Section 1910.1200 et seq. This MSDS is intended to be used solely for the purpose of satisfying informational requests made pursuant to that requirement. Compliance with all applicable federal, state, and local laws and regulations remains the responsibility of the user, and the user has the responsibility to provide a safe workplace, to examine all aspects of its operation, and to determine if or where precautions, in addition to those described herein, are or may be required.

2. PHYSICAL DATA

Not Applicable.

3. FIRE AND EXPLOSION HAZARD DATA

Not Applicable.

4. SPECIAL PROTECTION INFORMATION

VENTILATION: Local exhaust should be used to keep worker exposure below accepted exposure limits during welding and grinding operations.

RESPIRATORY PROTECTION: When engineering or administrative controls are not feasible to control overexposure or while they are being instituted, appropriate NIOSH approved respirators shall be used, and selected according to 29 CFR 1910.34.

EYE PROTECTION: Appropriate protective eye and face equipment shall be worn when there is a reasonable probability of injury that can be prevented by such equipment (such as welding, grinding).

PROTECTIVE GLOVES: Appropriate and as needed to protect against exposure to chemical or physical hazards.

OTHER: N/A

5. PHYSIOLOGICAL EFFECTS

PRIMARY ROUTE OF EXPOSURE

THRESHOLD LIMIT VALUE (TLV)

Inhalation of fumes from welding or burning;
dusts from grinding or cutting.

N/A

EFFECTS OF OVEREXPOSURE

Acute: Excessive inhalation of fumes from many metals can produce an acute reaction known as "metal fume fever". Though metals such as copper and zinc have been most associated with metal fume fever, it is suspected by some authorities (Casarett and Doull's Toxicology: The Basic Science of Poisons; Hamilton and Hardy: Industrial Toxicology) that other metallic fumes may produce this condition. Symptoms consist of chills and fever (very similar to and easily confused with flu symptoms), which come on a few hours after large exposure. Long-term effects of metal fume fever have not been noted.

Chronic: Only after six to ten years of exposure to iron dust or fume does one present any signs of pneumoconiosis. Physical examinations of those exposed to iron dust have not indicated any disability.

Excessive and prolonged inhalation of manganese (generally over 2 years exposure) can cause damage to the central nervous system. Specifically, the pathology resembles that of Parkinson's Disease. Other chronic effects may include bronchitis and pneumonitis.

6. EMERGENCY AND FIRST AID PROCEDURES

If acute overexposure to fumes occurs, remove victim from the adverse environment immediately to fresh air and seek medical attention.

7. ADDITIONAL COMMENTS

NOTE: The percent composition reflects the range that is possible within this GROUP of products. These are not the technical specifications for a particular product. Actual composition will fall within this range, but will depend on specifications for the particular product. Thus, when welding or cutting products containing manganese (for example), the potential for exposure to manganese obviously increases as their percentage composition increases. Therefore, we strongly urge that all operations with potentially hazardous exposures be evaluated by a competent industrial hygienist. See Section 4 & 5 for further information.

The steel itself presents no health hazard unless it is welded, burned, ground or cut. During these procedures it is possible that hazardous amounts of fume or dusts may be generated. It is advised that your particular operation be evaluated by a competent health professional to determine whether or not a hazard exists.

PREPARED UNDER DIRECTION OF: W.R. BELL

DATE: NOVEMBER 12, 1985

TELEPHONE NO: 216/441-6600

SUPERSEDES MSDS DATED: N/A

72-62-7820-01

Ashland Chemical Company

DIVISION OF ASHLAND OIL INC.

P O BOX 2219 COLUMBUS OHIO 43216 • (614) 889-3333

24-HOUR EMERGENCY TELEPHONE (606) 324-1133

**MATERIAL SAFETY
DATA SHEET**

002343

TRICHLOROETHANE 111 DEGREE COLD/V

PAGE: 2

SECTION V-HEALTH HAZARD DATA (CONTINUED)

SWALLOWING - CAN CAUSE GASTROINTESTINAL IRRITATION, NAUSEA, VOMITING, AND DIARRHEA.

FIRST AID:

IF ON SKIN THOROUGHLY WASH EXPOSED AREA WITH SOAP AND WATER. REMOVE CONTAMINATED CLOTHING. LAUNDRY CONTAMINATED CLOTHING BEFORE RE-USE.

IF IN EYES FLUSH WITH LARGE AMOUNTS OF WATER, LIFTING UPPER AND LOWER LIDS OCCASIONALLY, GET MEDICAL ATTENTION.

IF SWALLOWED, DO NOT INDUCE VOMITING. CALL PHYSICIAN OR TRANSPORT TO AN EMERGENCY FACILITY.

IF BREATHED: IF AFFECTED, REMOVE INDIVIDUAL TO FRESH AIR. IF BREATHING IS DIFFICULT, ADMINISTER OXYGEN. IF BREATHING HAS STOPPED, GIVE ARTIFICIAL RESPIRATION. KEEP PERSON ON WARM, QUIET AND GET MEDICAL ATTENTION. DO NOT GIVE STIMULANTS. EPINEPHRINE OR EPHEDRINE MAY ADVERSELY AFFECT THE HEART WITH FATAL RESULTS.

PRIMARY ROUTE(S) OF ENTRY:

INHALATION

SKIN CONTACT

SECTION VI-REACTIVITY DATA

HAZARDOUS POLYMERIZATION CANNOT OCCUR

STABILITY: STABLE

INCOMPATIBILITY: AVOID CONTACT WITH WATER, REACTIVE METALS SUCH AS ALUMINUM AND MAGNESIUM, OPEN FLAME, WELDING ARCS, RESISTANCE HEATERS, ETC., WHICH CAN RESULT IN THERMAL DECOMPOSITION RELEASING HYDROGEN CHLORIDE AND SMALL AMOUNTS OF PHOSGENE AND CHLORINE. STRONG OXIDIZING AGENTS.

SECTION VII-SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED:

SMALL SPILL: ABSORB LIQUID ON PAPER, VERMICULITE, FLOOR ABSORBENT, OR OTHER ABSORBENT MATERIAL AND TRANSFER TO HOOD.

LARGE SPILL: PERSONS NOT WEARING PROTECTIVE EQUIPMENT SHOULD BE EXCLUDED FROM AREA OF SPILL UNTIL CLEAN UP HAS BEEN COMPLETED. STOP SPILL AT SOURCE, DIME AREA OF SPILL TO PREVENT SPREADING, PUMP LIQUID TO SALVAGE TANK. REMAINING LIQUID MAY BE TAKEN UP ON SAND, CLAY, EARTH, FLOOR ABSORBENT, OR OTHER ABSORBENT MATERIAL AND SHOVELLED INTO CONTAINERS.

WASTE DISPOSAL METHOD

SMALL SPILL: ALLOW VOLATILE PORTION TO EVAPORATE IN HOOD. ALLOW SUFFICIENT TIME FOR VAPORS TO COMPILE. CLEAR HOOD DUCT WORK. DISPOSE OF REMAINING MATERIAL IN ACCORDANCE WITH APPLICABLE REGULATIONS.

LARGE SPILL: DESTROY BY LIQUID INCINERATION WITH OFF-GAS RECURRER. CONTAMINATED ABSORBENT MAY BE DEPOSITED IN A LANDFILL IN ACCORDANCE WITH LOCAL, STATE AND FEDERAL REGULATIONS.

SECTION VIII-PROTECTIVE EQUIPMENT TO BE USED

RESPIRATORY PROTECTION: IF TLV OF THE PRODUCT OR ANY COMPONENT IS EXCEEDED, A NIOSH/MSHA JOINTLY APPROVED AIR SUPPLIED RESPIRATOR IS ADVISED IN ABSENCE OF PROPER ENVIRONMENTAL CONTROL. OSHA REGULATIONS ALSO PERMIT OTHER NIOSH/MSHA RESPIRATORS UNDER SPECIFIED CONDITIONS (SEE YOUR SAFETY EQUIPMENT SUPPLIER) ENGINEERING OR ADMINISTRATIVE CONTROLS SHOULD BE IMPLEMENTED TO REDUCE EXPOSURE.

VENTILATION: PROVIDE SUFFICIENT MECHANICAL (GENERAL AND/OR LOCAL EXHAUST) VENTILATION TO MAINTAIN EXPOSURE BELOW TLV(S).

PROTECTIVE CLOVER: WEAR RESISTANT GLOVES SUCH AS POLYVINYL ALCOHOL, POLYETHYLENE.

EYE PROTECTION: CHEMICAL SPLASH GOGGLES IN COMPLIANCE WITH OSHA REGULATIONS ARE ADVISED. NIOSH/MSHA ALSO PERMIT OTHER TYPE SAFETY GLASSES (CONSULT YOUR SAFETY EQUIPMENT SUPPLIER).

OTHER PROTECTIVE EQUIPMENT: TO PREVENT REPEATED OR PROLONGED SKIN CONTACT, WEAR IMPERVIOUS CLOTHING AND BOOTS.

SECTION IX-SPECIAL PRECAUTIONS OR OTHER COMMENTS

CONTAINERS OF THIS MATERIAL MAY BE HAZARDOUS WHEN EMPTIED, SINCE EMPTIED CONTAINERS RETAIN PRODUCT RESIDUES (VAPOR, LIQUID, AND/OR SOLID), ALL HAZARD PRECAUTIONS GIVEN IN THE DATA SHEET MUST BE OBSERVED.

AVOID CONTACT WITH PLASTIC AND RUBBER I.E. EQUIPMENT, PROTECTIVE CLOTHING, AND CONTAINERS.

72-62-7820-01

**MATERIAL SAFETY
DATA SHEET**

002343

TRICHLOROETHANE 111 DEGREE COLD/V

PAGE: 1

THIS MSDS COMPLIES WITH 29 CFR 1910.1200 (THE HAZARD COMMUNICATION STANDARD)

PRODUCT NAME: TRICHLOROETHANE 111 DEGREE COLD/V
CAS NUMBER: 71-85-6

METAL SOURCE -
GREAT WESTERN STEEL CO.
8300 W 50 TH ST.
CHICAGO IL 60636

DS 50 021 3827180
DATA SHEET NO. 000166-009
LATEST REVISION DATE: 11/85-BA32A
PRODUCT: 1000000
INVOICE: 612945
INVOICE DATE: 10/11/85
TO: SAME

ATTN: PLANT MGR./SAFETY DIR.

SECTION I-PRODUCT IDENTIFICATION

GENERAL OR GENERIC ID: CHLORINATED HYDROCARBON

HAZARD CLASSIFICATION: (14) ORN-A

SECTION II-HAZARDOUS COMPONENTS

INGREDIENT	% (BY WT)	PEL	TLV	NOTE
1,1,1-TRICHLOROETHANE	90-95	350	350 PPM	(1)

(1): CONTAINING A PROPRIETARY INHIBITOR PACKAGE WHICH INCLUDES DIETHYLENE ETHER. DIETHYLENE ETHER HAS A PEL OF 100 PPM-SKIN AND A TLV OF 25 PPM-SKIN.

SECTION III-PHYSICAL DATA

PROPERTY	REFINEMENT	MEASUREMENT
INITIAL BOILING POINT	FOR PRODUCT	161.40 - 169.40 DEG F (72.00 - 76.00 DEG C)
VAPOR PRESSURE	FOR PRODUCT	100.00 MMHG (68.00 DEG F 20.00 DEG C)
VAPOR DENSITY	AIR = 1	4.5
SPECIFIC GRAVITY		1.324 (24.00 DEG C)
PERCENT VOLATILES		100.00%
EVAPORATION RATE	(ETHYL ETHER = 1)	2.60
APPEARANCE		CLEAR, ALPHA COLOR IS MAX
STATE		LIQUID
FORM		HOMOGENEOUS

SECTION IV-FIRE AND EXPLOSION DATA

FLASH POINT: NOT APPLICABLE

EXPLOSIVE LIMIT (PRODUCT):

LOWER: 6.7%

EXTINGUISHING MEDIA: WATER FOG

HAZARDOUS DECOMPOSITION PRODUCTS: MAY FORM TOXIC MATERIALS: CARBON DIOXIDE AND CARBON MONOXIDE, HYDROGEN CHLORIDE, PHOSGENE, VARIOUS HYDROCARBONS, ETC.

SPECIAL FIREFIGHTING PROCEDURES: WATER MAY BE USED TO KEEP FIRE EXPOSED CONTAINERS COOL UNTIL FIRE IS OUT.

WEAR SELF-CONTAINED BREATHING APPARATUS WITH A FULL FACEPIECE OPERATED IN PRESSURE DEMAND OR OTHER POSITIVE PRESSURE MODE WHEN FIGHTING FIRES.
UNUSUAL FIRE & EXPLOSION HAZARDS: NEVER USE WELDING OR CUTTING TOUCH ON OR NEAR DRUM (EVEN EMPTY) BECAUSE PRODUCT (EVEN JUST RESIDUE) CAN IGNITE EXPLOSIVELY.

MSHA CODES: HEALTH-2 FLAMMABILITY-1 REACTIVITY-0

SECTION V-HEALTH HAZARD DATA

PERMISSIBLE EXPOSURE LEVEL 350 PPM

THRESHOLD LIMIT VALUE 350 PPM

EFFECTS OF OVEREXPOSURE: FOR PRODUCT

EYES - CAN CAUSE SEVERE IRRITATION, REDNESS, TEARING, BLURRED VISION.
SKIN - PROLONGED OR REPEATED CONTACT CAN CAUSE MODERATE IRRITATION, DEFATTING, DERMATITIS.
BREATHING - EXCESSIVE INHALATION OF VAPOR CAN CAUSE NASAL AND RESPIRATORY IRRITATION, DIZZINESS, WEAKNESS, FATIGUE, NAUSEA, HEADACHE, POSSIBLE UNCONSCIOUSNESS, AND EVEN ASPHYXIAATION.


**MATERIAL SAFETY
DATA SHEET**

002343

TRICHLOROETHANE 111 DEGREES COLD/V

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SECTION IX - SPECIAL PRECAUTIONS OR OTHER COMMENTS (CONTINUED)

OVEREXPOSURE TO MATERIAL HAS APPARENTLY BEEN FOUND TO CAUSE THE FOLLOWING EFFECTS IN LABORATORY ANIMALS: LIVER ABNORMALITIES, KIDNEY DAMAGE, LUNG DAMAGE

OVEREXPOSURE TO MATERIAL HAS BEEN SUGGESTED AS A CAUSE OF THE FOLLOWING EFFECTS IN HUMANS: CARDIAC ABNORMALITY, LIVER ABNORMALITIES, KIDNEY DAMAGE, LUNG DAMAGE

THE INFORMATION ACCUMULATED HEREIN IS BELIEVED TO BE ACCURATE BUT IS NOT WARRANTED TO BE WHETHER ORIGINATING WITH ASHLAND OR NOT. RECIPIENTS ARE ADVISED TO CONFIRM IN ADVANCE OF NEED THAT THE INFORMATION IS CURRENT, APPLICABLE, AND SUITABLE TO THEIR CIRCUMSTANCES.


**MATERIAL SAFETY
DATA SHEET**

DEFINITIONS

THIS DEFINITION PAGE IS INTENDED FOR USE WITH MATERIAL SAFETY DATA SHEETS SUPPLIED BY THE ASHLAND CHEMICAL COMPANY. QUESTIONS CONCERNING THESE SHEETS SHOULD BE DIRECTED TO THE ENVIRONMENTAL AND OCCUPATIONAL SAFETY DEPARTMENT.

SECTION I
PRODUCT IDENTIFICATION

PRODUCT CLASS: GENERAL OR GENERIC IDENTIFICATION.

HAZARDOUS CLASSIFICATION: PRODUCT MEETS DOT CRITERIA FOR HAZARDS LISTED.

SECTION II
HAZARDOUS COMPONENTS

A HAZARDOUS INGREDIENT IS ONE WHICH MEETS ONE OR MORE OF THE FOLLOWING CRITERIA:

1. IT IS LISTED IN THE ANNUAL REGISTRY OF TOXIC EFFECTS OF CHEMICAL SUBSTANCES, OR IT IS KNOWN TO BE TOXIC WITHIN THE PARAMETERS OF THAT REGISTRY.

AND/OR

2. IT HAS A OSHA ESTABLISHED, 8-HOUR TIME-WEIGHTED AVERAGE PERMISSIBLE EXPOSURE LIMIT (PEL) OR ACCEPTABLE CEILING (C), OR AN AMERICAN CONFERENCE OF GOVERNMENTAL INDUSTRIAL HYGIENISTS (ACGIH) THRESHOLD LIMIT VALUE AND BY NATURE OF THE PRODUCT OR ITS KNOWN USE, IT IS LIKELY TO BECOME AIRBORNE.

AND/OR

3. IT CONTRIBUTES TO ONE OR MORE OF THE FOLLOWING HAZARDS OF THE PRODUCT:

- A. FLASHPOINT BELOW 200 DEG F (CC), OR SUBJECT TO SPONTANEOUS HEATING OR DECOMPOSITION.
- B. CAUSES SKIN BURNS (DOT)
- C. STRONG OXIDIZING AGENT. (DOT)
- D. SUBJECT TO HAZARDOUS POLYMERIZATION

EACH INGREDIENT MEETING ONE OR MORE OF THE ABOVE CRITERIA IS LISTED IN SECTION II IF PRESENT AT A LEVEL AT LEAST GREATER THAN ONE PERCENT. INGREDIENTS WHICH ARE CLAIMED TO BE CARCINOGENS, MUTAGENS, OR CAUSATIVE AGENTS OF OTHER REPRODUCTIVE DISORDERS ARE LISTED IF KNOWN OR BELIEVED TO BE PRESENT, PROVIDED THAT THE DATA SUPPORTING SUCH CLAIMS IS CONSIDERED VALID.

EACH HAZARDOUS INGREDIENT IS LISTED BY CHEMICAL, GENERIC, OR PROPRIETARY NAME ITS LEVEL IN THE PRODUCT IS EXPRESSED AS 1% OR LESS, 1-10%, 10-30%, 30-60%, OR GREATER THAN 60%, OR BY OTHER MEANS.

SECTION III
PHYSICAL DATA

INITIAL BOILING POINT: IF LIQUID AT OR DEG F.

VAPOR PRESSURE: IF LIQUID AT 68 DEG F OR WHICH SUBLIMES

VAPOR DENSITY: FOR VOLATILE PORTION OF PRODUCT

SPECIFIC GRAVITY: IF SPECIFIC GRAVITY OF PRODUCT IS NOT KNOWN, INDICATED AS 1, 1.1, OR 1.2.

PERCENT VOLATILES: PERCENTAGE OF MATERIAL WITH INITIAL BOILING POINT BELOW 425 DEG F

EVAPORATION RATE: INDICATED AS FASTER OR SLOWER THAN ETHYL ETHER, UNLESS STATED.

ADDITIONAL COMMENTS

ASHLAND WISHES TO INFORM YOU THAT SERIOUS ACCIDENTS HAVE RESULTED FROM THE MISUSE OF "EMPTY" CONTAINERS (DRUMS, 1 AND 5 GALLON PAILS, ETC.). REFER TO SECTIONS IV AND IX.

WE RECOMMEND THAT CONTAINERS BE EITHER PROFESSIONALLY RECONDITIONED FOR REUSE BY CERTIFIED FIRMS OR PROPERLY DISPOSED OF BY CERTIFIED FIRMS TO HELP REDUCE THE POSSIBILITY OF AN ACCIDENT. DISPOSAL OF CONTAINERS SHOULD BE IN ACCORDANCE WITH APPLICABLE LAWS AND REGULATIONS. "EMPTY" DRUMS SHOULD NOT BE GIVEN TO INDIVIDUALS.

SECTION IV
FIRE AND EXPLOSION HAZARDS

FLASH POINT: CLOSED CUP.

LOWER EXPLOSION LIMIT: INDICATED FOR COMPONENT WITH LOWEST VALUE.

HAZARDOUS DECOMPOSITION PRODUCTS: KNOWN HAZARDOUS PRODUCTS RESULTING FROM HEATING, BURNING, ETC., OR REACTED RAW MATERIAL WHICH MAY ARISE THROUGH HEATING, BURNING, ETC.

SPECIAL FIREFIGHTING PROCEDURES: INDICATE EQUIPMENT TO PROTECT FIREFIGHTER FROM TOXIC PRODUCTS OF COMBUSTION OR IF WATER IS NOT TO BE USED

UNUSUAL FIRE AND EXPLOSION HAZARDS: HAZARDS NOT COVERED BY OTHER SECTIONS OF THIS REPORT ARE KNOWN HERE

SECTION V
HEALTH HAZARD DATA

RECIPIENTS OF THIS DATA SHEET SHOULD CONSULT THE OSHA SAFETY AND HEALTH STANDARDS (29 CFR 1910), PARTICULARLY SUBPART G - OCCUPATIONAL HEALTH AND ENVIRONMENTAL CONTROL, AND SUBPART J - PERSONAL PROTECTIVE EQUIPMENT, FOR GENERAL GUIDANCE ON CONTROL OF POTENTIAL OCCUPATIONAL HEALTH HAZARDS.

PERMISSIBLE EXPOSURE LEVEL: OSHA ESTABLISHED PEL IF NONE AVAILABLE, ADOPTED VALUE

EFFECTS OF OVEREXPOSURE: GIVEN IN GENERAL TERMS, LOCAL AND SYSTEMIC EFFECTS TO THE EYES, SKIN, IF MATERIAL IS INHALED UNLESS NOT APPLICABLE DUE TO PHYSICAL FORM OF PRODUCT

SECTION VI
REACTIVITY DATA

HAZARDOUS POLYMERIZATION: CONDITIONS TO AVOID HAZARDOUS POLYMERIZATION RESULTING IN A LARGE RELEASE OF ENERGY

STABILITY: CONDITIONS TO AVOID IF UNSTABLE UNDER NORMAL CIRCUMSTANCES

INCOMPATIBILITY: MATERIALS TO AVOID

SECTION VII
SPILL OR LEAK PROCEDURES

REASONABLE PRECAUTIONS TO BE TAKEN AND THE METHOD OF CLEANUP TO BE USED IN THE EVENT OF SPILLAGE OF THE PRODUCT. CONSULT FEDERAL, STATE AND LOCAL REGULATIONS FOR ACCEPTED PROCEDURES AND ANY REPORTING OR NOTIFICATION REQUIREMENTS.

SECTION VIII
PROTECTIVE EQUIPMENT TO BE USED

THIS SECTION INDICATES PROTECTIVE EQUIPMENT TO BE USED WHEN HANDLING THE PRODUCT.

SECTION IX
SPECIAL PRECAUTIONS OR OTHER COMMENTS

THIS SECTION IS TO COVER ANY RELEVANT POINTS NOT PREVIOUSLY MENTIONED

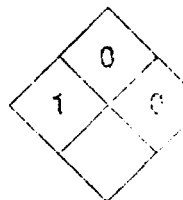
Material Safety Data Sheet

May be used to comply with
OSHA's Hazard Communication Standard,
29 CFR 1910.1200. Standard must be
consulted for specific requirements.

CERRO COPPER PRODUCTS COMPANY

MSDS NUMBER - CCPC-00-0047

OMB NO. 1216-0072



IDENTITY (As Used on Label and List)

MIRACHEM 100 CLEANER/DEGREASER CONCENTRATE

Note: Blank spaces are not permitted. If any item is not applicable, the information is available, the space must be marked "N/A".

Section I

Manufacturer's Name

MIRACHEM CORPORATION

Emergency Telephone Number

(602) 566-3030

Address (Number, Street, City, State, and ZIP Code)

2107 E. 5TH STREET

Telephone Number for Information

(602) 566-3030

TEMPE, ARIZONA 85281-3034

Date Prepared

JULY 1989

Signature of Preparer (optional)

Section II -- Hazardous Ingredients/Identity Information

Hazardous Components (Specific Chemical Identity; Common Name(s))	OSHA PEL	ACGIH TLV	Other Limits Recommended	fs (optional)
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THE PRODUCT IS A MIXTURE. AS SET FORTH IN SUBPART 2 PART 1910 OF TITLE 29 CFR, THE PRODUCT IS NOT CONSIDERED A HEALTH OR PHYSICAL HAZARD. IN EVALUATING THE PRODUCT, NONE OF ITS INGREDIENTS ARE FOUND ON ANY LISTS OF HAZARDOUS CARCINOGENIC OR BANNED CHEMICAL AGENTS OR MATERIALS GENERATED BY THEM. AGENCIES SURVEYED INCLUDED THE NATIONAL CANCER INSTITUTE, E.P.A., F.D.A., NATIONAL SCIENCE FOUNDATION, O.S.H.A. (CALIFORNIA AND FEDERAL), CONSUMER PRODUCT SAFETY COMMISSION, DEPARTMENT OF TRANSPORTATION (SAFETY INSTITUTE AND RESEARCH SPECIAL PROGRAMS ADMINISTRATION) AND NATIONAL TOXICOLOGY PROGRAM. THE PRODUCT IS AN AQUEOUS EMULSION OF D.I. WATER, SURFACTANTS, EMULSIFIERS, STABILIZERS TO ADJUST PH, AND C9 TO C12 HYDROCARBONS. THE PRODUCT IS CONSIDERED BIOLOGICALLY INERT AND IS A V.O.C. OF 91 GMS/LITER OR .77 LBS/GAL.

THE PRODUCT HAS BEEN TESTED FOR SAFETY BIOLOGICALLY. TEST REPORTS ARE AVAILABLE ON REQUEST.

Section III -- Physical/Chemical Characteristics

Boiling Point	212F	Specific Gravity (H ₂ O = 1)	.885
Vapor Pressure (mm Hg.)	<20	Melting Point	N/A
Vapor Density (AIR = 1)	.9	Evaporation Rate (Butyl Acetate = 1)	<1

Solubility in Water

COMPLETE EMULSIFICATION IN WATER

Appearance and Odor

CLEAR TO MILKY LIQUID -- MILD ODOR

Section IV -- Fire and Explosion Hazard Data

Flash Point (Method Used)	Flammable Limits	NON-FLAMMABLE	LEL	UEL
PMCC -- NONE (ASTM D93)		NON-COMBUSTIBLE	N/A	N/A

Extinguishing Media

NONE

Special Fire Fighting Procedures

NONE

Unusual Fire and Explosion Hazards

NONE

Section V — Reactivity Data

Stability	Unstable		Conditions to Avoid
	Stable	XX	OXIDIZING AND REDUCING AGENTS
Incompatibility (Materials to Avoid)		STRONG ACIDS AND ALKALIES DEMULSIFY PRODUCT	
Hazardous Decomposition or Byproducts		THERMAL DECOMPOSITION MAY PRODUCE CO ₂	
Hazardous Polymerization	May Occur		Conditions to Avoid
	Will Not Occur	XX	

Section VI — Health Hazard Data

Route(s) of Entry:	Inhalation? NON-HAZARDOUS	Skin? NON-HAZARDOUS	Ingestion? NON-HAZARDOUS	LD50 > (gm/kg)
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Health Hazards (Acute and Chronic)

ACUTE — NO KNOWN HAZARD AS CONSIDERED BY THE NATIONAL PAINT AND COATINGS ASSOCIATION REISED HMR DATING MANUAL FOR LD50 ORAL TOXICITY, D.O.T. CORROSIVITY SKIN TEST AND LC50 INHALATION TOXICITY. CONSIDERED MILD TO MODERATE EYE IRRITANT IF NOT WASHED FROM EYES IMMEDIATELY. WHEN WASHED IMMEDIATELY, NO IRRITATION OCCURRED. CHRONIC — NOT YET DETERMINED; HOWEVER, NO KNOWN HAZARDS TO DATE.

Carcinogenicity:	NTP?	IARC Monographs?	OSHA Regulated?
NONE	NO	NO	NO

Signs and Symptoms of Exposure	PRODUCT CONSIDERED NON-HAZARDOUS
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Medical Conditions Generally Aggravated by Exposure	NONE KNOWN
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Emergency and First Aid Procedures	IF SPLASHED IN EYES, IMMEDIATELY FLUSH WITH WATER AND CONSULT PHYSICIAN.
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Section VII — Precautions for Safe Handling and Use

Steps to Be Taken in Case Material is Released or Spilled	FLUSH WITH WATER INTO CONTAINING AREA.
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Waste Disposal Method	FLUSH TO SEWER WHERE APPLICABLE WITHIN FEDERAL OR LOCAL WASTE DISPOSAL REQUIREMENTS.
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Precautions to Be Taken in Handling and Storing	USE WITH ADEQUATE VENTILATION. PROTECT FROM FREEZING.
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Other Precautions	KEEP OUT OF REACH OF CHILDREN.
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Section VIII — Control Measures

Respiratory Protection (Specify Type)	NO SPECIAL REQUIREMENTS. IF PRODUCT IS SPRAYED OR VAPORIZED, A NIOSH CERTIFIED SELF-CONTAINED RESPIRATOR IS RECOMMENDED (BUT NOT REQUIRED).		
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Ventilation	Local Exhaust	NO SPECIAL REQUIREMENTS RECOMMEND ADEQUATE VENTILATION	Special	NONE
	Mechanical (General)	NONE	Other	NONE

Protective Gloves	NO SPECIAL REQUIREMENT. NITRILE GLOVES ARE RECOMMENDED (BUT NOT REQUIRED).	Eye Protection	ANTI-SPLASH GOGGLES ARE RECOMMENDED.
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Other Protective Clothing or Equipment	NONE REQUIRED
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Work/Hygienic Practices	ALTHOUGH NOT REQUIRED, WE RECOMMEND AS GOOD HYGIENIC PRACTICE THE USE OF PREVENTIVE MEASURES — SUCH AS GLOVES, GOGGLES, ETC.
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DEPRO COPPER PRODUCTS COMPANY
MSDS NUMBER - CCPC-00-0368

MATERIAL SAFETY DATA SHEET

MFG. CODE # 58

SECTION I

MANUFACTURER'S NAME MODERN RESEARCH CORPORATION		EMERGENCY TELEPHONE NO. (313) 585-4583
ADDRESS (number, Street, City, State, and ZIP Code) 431 Stephenson Highway Troy, Michigan 48063		
CHEMICAL NAME AND SYNONYMS N/A	TRADE NAME AND SYNONYMS MR-625 PF	
CHEMICAL FAMILY N/A	FORMULA N/A	

SECTION II - HAZARDOUS INGREDIENTS

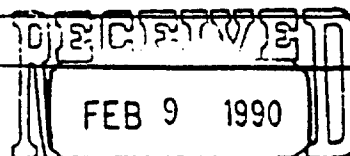
PAINTS, PRESERVATIVES, & SOLVENTS	%	TLV (Units)	ALLOYS AND METALLIC COATINGS	%	TLV (Units)
PIGMENTS			BASE METAL		
CATALYST			ALLOYS		
VEHICLE			METALLIC COATINGS		
SOLVENTS Dipropylene Glycol Methyl Ether	>1	100 ppm	FILLER METAL PLUS COATING OR CORE FLUX		
ADDITIVES CAS # 34590-94-8			OTHERS		
OTHERS C₇H₁₆O₂					
HAZARDOUS MIXTURES OF OTHER LIQUIDS, SOLIDS, OR GASES				%	TLV (Units)
<p><i>Per phone call to Mike Kay of Modern Research on 11/2/90 the solvent concentration is approximately 5%.</i></p>					

SECTION III - PHYSICAL DATA

BOILING POINT (°F)	212	SPECIFIC GRAVITY (H ₂ O = 1)	0.00
VAPOR PRESSURE (mm Hg)	N/A	PERCENT VOLATILE BY VOLUME (%)	6
VAPOR DENSITY (AIR = 1)	N/A	EVAPORATION RATE (WATER = 1)	1
SOLUBILITY IN WATER	infinite	PH	N/A
APPEARANCE AND ODOR Clear blue liquid with sweetish odor			

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (Method used) None	T.O.C.	FLAMMABLE LIMITS	Let N/A	Uet N/A
EXTINGUISHING MEDIA N/A				
SPECIAL FIRE FIGHTING PROCEDURES Fire fighters should wear full protective clothing including self-contained breathing equipment operated in a positive mode.				
UNUSUAL FIRE AND EXPLOSION HAZARDS None				



E&E AFFAIRS

THRESHOLD LIMIT VALUE 100 ppm PRIMARY ROUTES OF ENTRY Inhalation ☒ Skin Contact ☒ Other (specify)

EFFECTS OF OVEREXPOSURE

Eyes- irritation, pain. Skin- prolonged contact will defat tissues leading to dermatitis.
Ingestion- nausea, vomiting, diarrhea.

EMERGENCY AND FIRST AID PROCEDURES

Eyes- flush with copious amounts of water. Lifting lids and removing contact lenses to ensure complete irrigation- get medical attention if irritation persists. Skin- flush affected area with water. Inhalation- remove to fresh air. Ingestion- give fluids- get medical attention.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE

None known

Carcinogen

No

NTP ☐

IARC ☐

Other ☐

SECTION VI - REACTIVITY DATA

STABILITY	UNSTABLE		CONDITIONS TO AVOID
	STABLE	XX	
Freezing			
INCOMPATIBILITY (MATERIALS TO AVOID) Strong oxidizers			
HAZARDOUS DECOMPOSITION PRODUCTS Oxides of Carbon			
HAZARDOUS POLYMERIZATION	MAY OCCUR		CONDITIONS TO AVOID
	WILL NOT OCCUR	XX	

SECTION VII - SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

Dike area to contain spill. Use absorbent material to soak up spill. Sweep or shovel into container for disposal.

WASTE DISPOSAL METHOD

In accordance with all local, state, and federal regulations.

SECTION VIII - SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION (See 1910.134)

In areas where TLV is exceeded use NIOSH/MSHA approved respirator.

VENTILATION	LOCAL EXHAUST	at points of vapor emission	SPECIAL
	MECHANICAL EXHAUST	to control TLV	OTHER

PROTECTIVE GLOVES

Impervious

EYE PROTECTION

Chemical goggles

OTHER PROTECTIVE EQUIPMENT

Eyewash and safety shower

SECTION IX - SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORING

Avoid contact- wear protective clothing and wash thoroughly after using. Avoid inhalation of vapors and spray mists. Do not take internally. Keep Out of Reach of Children.

OTHER PRECAUTIONS

Name (print)	Barry Morrison
Signature	<i>Barry Morrison</i>
Title	Chemist
Preparation Date	10-30-86
Phone Number	603 508 1507